

T H E
Gentleman's Diary,
O R T H E
MATHEMATICAL REPOSITORY;
An ALMANACK
For the YEAR of our LORD 1769.
B E I N G

The FIRST after BISSEXTILE, or LEAP-YEAR.
Containing many useful and entertaining Particulars,
peculiarly adapted to the ingenious Gentlemen en-
gaged in the most delightful Study and Practice of the
M A T H E M A T I C K S.

The Twenty-ninth *Almanack* published of this Kind;
and the Seventeenth of the NEW STYLE in ENGLAND.

———— With wise Intent
The Hand of Nature on peculiar Minds
Imprints a diff'rent Byass, and to each
Decrees its Province in the common Toil.
To some she taught the Fabric of the Sphere,
The changeful Moon, the Circuit of the Stars,
The golden Zones of Heav'n: to some she gave
To weigh the Moment of eternal Things,
Of Time, and Space, and Fate's unbroken Chain,
And Will's quick Impulse. ————— AKENSIDE.

L O N D O N,
Printed for the Company of STATIONERS.
M.DCC.LXIX.

[Price Nine-pence fitch'd.]



304

ALL Persons who please to be CONTRIBUTORS to this DIARY, by answering the *Questions, Enigmas, &c.* or by sending *new ones*, or any other useful, entertaining and improving *Subjects* proper for this WORK; are earnestly desired to send *them*, and their *Solutions at large along with them* (otherwise they need not expect their *Publication*) before the first Day of *May 1769*: Directed, for the *Author of the Gentleman's Diary*; and to be left with Mr. HENRY CROPPER, Attorney at Law, in *Loughborough*, who will forward them to the Author.

P R O P O S A L S

FOR MAKING, and PUBLISHING by SUBSCRIPTION,
A new and accurate MAP of the County of LEICESTER,
From an actual Survey of the same.

By THOMAS PEAT, of *Thringston*, Surveyor, and Assistants.

In this *Map* will be particularly noted and planned all the Market Towns, with their true Distances, and all notable Villages thro' which any principal Roads do pass. The Place and Distance of every Village will be truly ascertained, and expressed. All the great Roads, and Turnpikes, will be taken and laid down from Chain Measure, as also the smaller from one Village to another, and a proper Distinction preserved. The County will be truly bounded, and properly divided according to its several Hundreds. The *Forest Boundaries*, and those of the large Commons, will be pointed out. The Course of all the Rivers and Rivulets, will be exactly described. The several *Seats* of the *Nobility* and *Gentry* will be truly fixed in this *Map*. All Places noted for Curiosities in Nature, as *Minerals, &c.* or for *Antiquities*, or any remarkable Occurrences, will be taken Notice of in such Manner as to render it also a general View of the Natural History of the COUNTY. Also the LATITUDE of every Market Town will be accurately determined, together with its LONGITUDE from the Meridian of LONDON, &c.

C O N D I T I O N S.

This Work will be Engraved by the best Hands; and decorated with the Arms of such of the *Nobility* and *Gentry*, as choose to have them emblazon'd; and other proper Embellishments, so as to render the Whole as compleat as any Thing of the Kind.

The Scale is proposed to be one Statute Mile in an Inch.

The Price to Subscribers will be Half a Guinea; Five Shillings to be paid in the Course of the Survey, and the Remainder on Delivery of the Map; except those who have their *Arms* in the Margin; who are to pay Half a Guinea at Subscribing, and Half a Guinea more on the Delivery.

The Work will be carried on with all convenient Expedition, provided the Projectors meet with a proper Encouragement, adequate to so large an Undertaking; and whoever will be so kind, are desired only to send their Names to Mr. JOHN GREGORY, Printer, in Leicester, as no Subscription Money will be required, before a proper Judgment can be formed.

N.B. Lands survey'd, divided, and inclosed; and Maps of the same correctly delineated; also Timber valued, Houses, and other Buildings, designed, drawn, surveyed, and estimated, by the said THOMAS PEAT, late of Nottingham, now of Thringston, in the County of Leicester.

All Letters are desired to be sent Post paid.

JANUARY hath xxxi Days.

[M] ☉ Decl
[D] South.

New Moon the 8th }
First Quarter the 15th } Day at { 45 m. past 2 Morn.
Full Moon the 22d } { 20 m. past 8 Morning.
Last Quarter the 29th } { 4 in the Morning.
 { 25 m. past 8 at Night.

1 220 51
6 22 27
11 21 44
16 20 51
21 19 47
26 18 2

21	1	A	Circumcision, 1 Sund. aft. Christ	1M44	0	38
22	2		Day 7 hours and 53 min. long be	2	53	7 2.
23	3		ing now increased, and nights	3	59	8 7
24	4		shortened, a quarter of an hour.	5	2	8 56
25	5	Th	Old Christmas Day	6	1	9 45
26	6	F	Epiph. CHRIST's *app. to Gent.	6	50	10 36
27	7	S	Days are increasing daily.	7	32	11 30
28	8	A	1 Sunday after Epiphany.	Sets	0	18
29	9	M	Canterbury.	5A56	1	7
30	10	Tu	Days 8 hours 10 m. long.	7	11	1 56
31	11	W	Night 15 hours 50 m. long.	8	27	2 42
Ja	12	Th	Old New Years Day.	9	45	3 29
2	13	F	Hilary, Bish. and Con.	11	4	4 18
3	14	S	Preston, Lanc.	Morn.	5	6
4	15	A	2 Sunday after Epiphany.	0	24	5 57
5	16	M	Hickford, Lanc.	1	47	6 52
6	17	Tu	Tavistock, Devonsh.	3	8	7 51
7	18	W	QUEEN CHAR. Birth-day kept.	4	25	8 51
8	19	Th	(Fair at Nottingham the 20th)	5	31	9 52
9	20	F	In eight Days of St. Hilary. 1 Ret.	6	22	10 50
10	21	S	Agnes, Rom. Virgin and Mart.	7	8	11 46
11	22	A	Septuagesima Sunday.	Rises	Morn.	
12	23	M	Hilary Term begins.	6A30	0	40
13	24	Tu	De. by.	7	46	1 28
14	25	W	Conversion of St. Paul.	8	58	2 14
15	26	Th	Days increased 1 hour,	10	9	2 58
16	27	F	From the Day of St. Hil. in 15 D.	11	18	3 41
17	28	S	and nights are shortening apace.	Morn	4	23
18	29	A	Sexagesima Sunday.	0	26	5 7
19	30	M	K. CHAR. I. Mart. at Whitehall.	1	35	5 53
20	31	Tu	12 min. past 1, 1649.	2	41	6 40

M D	☉ Rises	☉ Sets	☿ Rises	♂ Rises	♂ Sets	♀ Sets	DBreak	Cl. bet. ☉
1	8h 4	3 56	4 A 3	3 M 32	2 M 33	6 A 57	5	59 4' 22'
6	8 0	4 0	Sets	3 15	2 25	7 11	5	57 6 38
11	7 55	4 5	7 M 40	2 50	2 7	7 25	5	53 8 43
16	7 50	4 10	7 20	2 33	1 59	7 35	5	49 10 32
21	7 44	4 16	6 50	2 16	1 51	7 53	5	44 12
26	7 36	4 24	6 30	2 0	1 4	8 7	5	38 13 15

M Dec
D South.

1	16	57
6	15	2
11	13	50
16	12	8
21	10	21
26	8	30

21	1	W	Bromley, Lanc. Reading, Berks. (r.	3 M 40	7 M 29
22	2	Th	Purif. Blef. Vir. Mary. Cand. D.	4 34	8 18
23	3	F	On the Mor. of the Purif. Blazius, B.	5 19	9 8
24	4	S	<i>Graves. Kent. Plymouth, Devon.</i>	5 56 10	1 1
25	5	A	Quin. Sund. Shrove Sund.	6 26 10	5 1
26	6	M	Day 9 hours 28 min. long.	Sets.	11 42
27	7	Tu	Shrove Tuesday.	6 A 6 0 A	3 1
28	8	W	Ash-Wednesday. First Day of Lent.	7 24	1 19
29	9	Th	In 8 Days of the Purif. B. V. M.	8 44	2 9
30	10	F	Days increased 1 hour 58 min.	10 6	2 59
31	11	S	<i>Llandysfel, Monmouthshire.</i>	11 30	3 50
Fe 12	A		Quadragesima. 1st Sun. in Lent.	Morn.	4 41
2 13	M		Old Candlemas Day. Term Ends.	0 51	5 4
3 14	Tu		Valentine, Bish. and Mart.	2 9	6 42
4 15	W		Ember Week.	3 17	7 40
5 16	Th		Days 10 h. 4 m. long, being now	4 13	8 39
6 17	F		increased 2 hours 26 min.; and	4 56	9 35
7 18	S		nights shortened as much.	5 29	10 29
8 19	A		2d Sunday in Lent.	5 54	11 17
9 20	M		<i>Beverley, Yorksh.</i>	Rises.	Morn.
10 21	Th		<i>Norton, Oxfordshire.</i>	6 37	0 4
11 22	W		<i>Godalming, Surrey.</i>	7 48	0 51
12 23	Th		Day 10 hours and 36 min. long. F.	8 59	1 33
13 24	F		St. Matthias. A. & M.	10 8	2 17
14 25	S		<i>Feverham, Kent. Caernarvon.</i>	11 17	3 1
15 26	A		3d Sunday in Lent.	Morn.	3 46
16 27	M		<i>Oundle, Northamptonshire.</i>	0 24	4 32
17 28	Tu		<i>Chesterfield, Derbyshire.</i>	1 27	5 21

V	D	C	Rates	Sets	H	Sets	L.R.	Sets	S	Sets	D.B.	Bran	C
1	7	26	4	35	6M	5	IM42	IM40	8	A25	5	30	14 14"
6	7	26	4	44	5	39	I 27	I 34	8	39	5	22	14 41
11	7	8	4	53	5	20	I 12	I 28	8	53	5	14	14 46
16	6	59	5	2	4	58	O 54	I 24	9	7	5	6	14 34
21	6	49	5	12	4	39	O 38	I 19	9	23	4	57	14 3
26	6	20	5	22	4	2	O 15	I 17	9	36	4	28	12 12

MARCH hath xxxi Days.

[M] Decl.
[D] South

New Moon the 8th
First Quarter the 14th
Full Moon the 22d
Last Quarter the 30th

Day at { half past 6 in the Morn.
half past 11 at Night.
45 m. past 9 in Morn.
5 m. past 1 in Aftern.

17° 22"
6 5 37
11 3 30
16 1 31
21 0 27
26 2 25

18	1	W	David, Abp. Men. <i>Galgarth</i> , Breckn.	2M	24	6	M	9
19	2	Th	Cedde, or Chad. <i>Stockport</i> , Chesh.	3	13	6		59
20	3	F	Days are now above 11 h. long.	3	53	7		51
21	4	S	<i>Melton-Mowbray</i> , Leicestershire.	4	27	8		43
22	5	A	Midlent. S. Ps. of Hesse b. 1722	4	53	9		34
23	6	M	<i>Epping</i> , Essex. <i>Rochford</i> , Essex.	5	16	10		24
24	7	Tu	Perpetua Maurit. Mart. <i>Notting.</i>	5	37	11		13
25	8	W	Days are now increased, and nights	Sets.	0	A	3	
26	9	Th	shortened, 3 hours and 3 quarters.	7	A	49	0	55
27	10	F	<i>Weathermongers</i> need not be anxious	9	15	1		46
28	11	S	about it: God knows what is best.	10	40	2		42
29	12	A	5 Sund. in Lent.	Morn.	3			40
30	13	M	Days are increasing daily.	0	2	4		40
31	14	Tu	<i>Brimwelbanks</i> , Norf.	1	14	5		41
1	15	W	<i>Oakham</i> Rutl. <i>Ofwestry</i> , Shrop.	2	15	6		38
2	16	Th	<i>Pensance</i> , Cornwall.	3	0	7		34
3	17	F	<i>Hariff</i> , Hunt. <i>Malmesbury</i> , Wilts.	3	37	8		27
4	18	S	Ed. K. of W. Sax. <i>Loughbro'</i> , Leic.	4	4	9		18
5	19	A	Palm Sunday.	4	26	10		0
6	20	M	<i>Dolton</i> , Dev. <i>Durham</i> . <i>Ruthin</i> , Den.	4	46	10		52
7	21	T	Benedict. Abbot. <i>Downes</i> , Devon.	5	3	11		39
8	22	W	Equal day and night.	Rises.	Morn.			
9	23	Th	<i>Nottingham</i> , for all sorts of Cattle.	8	A	0		19
10	24	F	Good Friday.	9	9	1		3
11	25	S	Lady-Day.	10	18	1		48
12	26	A	Easter-Day, Our Saviour's Resur.	11	22	2		3
13	27	M	Easter Monday.	Morn.	3			20
14	28	Tu	Easter Tuesday.	0	2	4		9
15	29	W	<i>Preston</i> , Lanc. <i>Stourbridge</i> , Worc.	1	12	5		0
16	30	Th	Day 12 hours and 3 quart. long	1	55	5		50
17	31	F	<i>Midhurst</i> , Suff. <i>Derby</i> . <i>Northmore</i> .	2	31	6		40

M	D	☉ Rites	☉ Sets	☿ Sets	♂ Rises	♂ Sets	♀ Sets	DBreak	Cl.bef.☉							
1	6	34'	5	27	4M11	0M 4	1M14	9A46	4	43	12'	42"				
6	6	24	5	37	3	53	11A44	1	9	10	0	4	32	11	35	
11	6	14	5	47	3	35	11	24	1	5	10	14	4	21	10	16
16	6	4	5	57	3	17	11	4	1	3	10	28	4	11	8	50
21	5	54	6	7	2	59	10	44	1	1	10	42	4	0	7	20
26	5	44	6	17	2	40	10	24	0	59	11	0	3	19	5	47

A P R I L hath xxx Days.

M ☉ D
D North

New Moon the 6th	} Day at {	10 m. before 5 Aftern.	6	6	30
First Quarter the 13th		4 m. past 8 in the Foren.	11	8	3
Full Moon the 21st		50 m. past Midnight.	16	10	10
Last Quarter the 29th		3 quart. past 4 Morning.	21	12	3
			26	13	41

21	1	S	All Fool's Day. <i>Coventry, Warw</i>	3 M	0	7	3	1
22	2	A	1st Sunday after Easter. Low-5.	3	25	8	19	
23	3	M	Richard, Bishop of Chichester.	3	45	9	7	
24	4	Tu	Saint Ambrose, B. of Mil.	4	6	9	56	
25	5	W	Old Lady-Day. <i>Doncaster, Hunt.</i>	4	26	10	46	
26	6	Th	<i>Epping, Essex. Rochford, Essex.</i>	Set.	11	35		
27	7	F	<i>Atherstone, Warwickshire.</i>	8 A	22	0	A	36
28	8	S	Days incr. 5 hours 40 min.	9	47	1	35	
29	9	A	2d Sunday after Easter.	11	6	2	37	
30	10	M	From the Day of Easter in 15 Days.	Morn.	3	40		
31	11	Tu	Day 13 hours 36 min. long.	0	12	4	41	
A	12	W	Term begins.	1	5	5	39	
2	13	Th	<i>Asbburn, Derb. Budworth, Chesh.</i>	1	45	6	35	
3	14	F	Days increased 6 hours 2 min.	2	14	7	24	
4	15	S	<i>Bewley, Hampshire. Derby.</i>	2	39	8	1	
5	16	A	3d Sunday aft r Easter.	3	0	8	58	
6	17	M	From the Day of Easter in 3 weeks.	3	17	9	41	
7	18	Tu	<i>Malmsbury, Wilts.</i>	3	34	10	25	
8	19	W	Alphage, Archbishop of Cant.	3	51	11	5	
9	20	Th	<i>Worcester. Cank, Staff. Narse, Dev.</i>	Rises.	11	5		
10	21	F	<i>Modbury, Dev. Runcy, Kent.</i>	8 A	13	Morn.		
11	22	S	<i>Shrewsbury, Shropsh. Gisboro', Y.</i>	9	18	0	37	
12	23	A	4th Sunday after East. St. George	10	18	1	24	
13	24	M	From the D. of Easter in 1 mon.	11	13	2	13	
14	25	Tu	St. MARK, Evan.	11	58	3	3	
15	26	W	☉ amp. 18° 12' ☉ d. east 42' p. 6.	Morn	3	52		
16	27	Th	<i>Boroughbridge, Yorkshire.</i>	0	35	4	41	
17	28	F	<i>Soham, Camb. Aberforrh, Y.</i>	1	7	5	29	
18	29	S	<i>Market-Harboro' Leic. Newchurch.</i>	1	33	6	16	
19	30	A	5 Sund. after East r. Rogat Sund.	1	54	7	5	

W	D	☉ Rises.	☉ Sets	h Sets	☿ Rises.	♂ Sets.	♀ Sets.	DBreak	C. bef. ☉
1	5	33	6	28	2 M 2	10 M 2	0 M 56	11 A 11	3 33 3' 55'
6	5	23	6	38	2	2	9 41	0 51	11 20 2 24
11	5	13	6	48	1	44	9 20	0 45	11 26 3 6 0 58
16	5	4	6	57	1	25	8 59	0 40	11 26 2 54 0 aft. 19
21	4	54	7	7	1	8	8 38	0 35	11 30 2 40 1 28
26	4	45	7	7	0	5	8 16	0 20	11 30 2 23 2 2

M	⊙	Decl.
D		North

Laft Quarter the 28th

Day at { 4 min. past 1 Morn.
40 min. past 5 Aftern.
45 min. past 4 Aftern.
36 min. past 4 Aftern.

1	15 ⁰	14
6	16	47
11	18	1
16	19	14
21	20	18
26	21	14

20	1	M.	St. Ph. & Ja. From the D. E. in 5w	2M	13	7M	53
21	2	Tu	<i>Totness. Lancaſter. Arundel, Suffex.</i>	2	33	8	40
22	3	W	Rogation Week Inv. of the Croſs	2	53	9	30
23	4	Th	Holy Thursday.	3	15	10	23
24	5	F	On the Morrow of the Aſcenſion	3	43	11	18
25	6	S	<i>Abingdon, Berks. Kendall, Weſtm.</i>	Sets.	0	Az	
26	7	A	6th Sunday after Eaſter.	10	A	0	1
27	8	M	Term Ends. <i>Pilip-Norton, Som.</i>	11	1	2	32
28	9	Tu	<i>Boſworth, Leic. Tokington, Glouc</i>	11	47	3	32
29	10	W	<i>Higham-Ferrers, North. Lutterworth.</i>	Morn.	4	31	
30	11	Th	<i>Leiceſter. Dunſtable, Bedf. Crediton.</i>	0	21	5	25
M	12	F	Old May Day. <i>Hertford. Tuxford.</i>	0	47	6	14
2	13	S	<i>Tiddeſwell, Derb. Crouch, Eſſex.</i>	1	8	7	1
3	14	A	Whit Sunday.	1	27	7	46
4	15	M	Monday. <i>Southwell, Notting.</i>	1	44	8	27
5	16	Tu	Tuesday. <i>Newark. Notting.</i>	2	0	9	9
6	17	W	Ember Week. <i>Lenton, Notting.</i>	2	18	9	53
7	18	Th	<i>Bingham, Notting. Haſebury, Bucks.</i>	2	39	10	37
8	19	F	Qu. CHARLOTTE born, 1744.	3	3	11	24
9	20	S	<i>Galgath, Breckn. Wickham, Hants.</i>	Riſes.	Morn.		
10	21	A	Trinity Sunday.	9	A	11	0
11	22	M	On the Morrow of the H. Trinity.	9	59	1	1
2	23	Tu	<i>Bayborough, Som. Skeffeld, York.</i>	10	37	1	50
13	24	W	☉ due E. 7h 3.' ☉ ampl. 36° 11'	11	10	2	39
14	25	Th	<i>Dagenham, Eſſex. Malmſbury, Wilts.</i>	Corpus	Chriſti.		
15	26	F	Term begins.	11	59	4	13
16	27	S	<i>Ven. Bede. Stortford, Hertfordſh.</i>	Morn.	4	54	
17	28	A	1ſt Sunday after Trinity.	0	18	5	45
18	29	M	K. CHAR. II. Birth and Return.	0	36	6	31
19	30	Tu	In 8 Days of the II. Tr. (May 29)	0	56	7	19
20	1	W	Days increaſed 8 hours and half	1	16	8	11

	Males	Sets	♂ Sets	Males	♂ Sets	♀ Sets	DBreak	Cl.aft.
I	4 35	7 26	0 M 37	7 A 53	0 M 23	11 A 26	2 6	3 10
6	4 28	7 33	0 9	S s.	0 17	11 0	1 48	3 42
I	4 20	7 41	11 50	4 20	0 0	10 45	1 28	3 59
6	4 12	7 49	11 35	3 50	11 A 55	10 17	1 5	4 2
21	4 5	7 56	11 20	3 35	11 42	10 0	0 32	3 50
6	3 59	8 11	11 0	3 20	11 20	0 32	nonight	3 25

J U N E hath xxx Days.

M | Decl.
D | North

New Moon the 4th
First Quarter the 11th
Full Moon the 19th
last Quarter the 27th

Day at { 23 m. past 8 Morn.
 53 m. past 4 M. no.
 20 m. past 8 Morn.
 58 m. after Midnight.

1	22°	9'
6	22	44
11	23	9
16	23	24
21	23	29
26	23	23

21	1	Th	Nicom. Rom. Pr. and Mar.	1M	39	9	M	4
22	2	F	Dawentry, North. Market-Jew, Cor.	2	8	10		2
23	3	S	Sun ecl. visible the 4th at 7 Morn.	2	46	11		4
24	4	A	2 S. aft. Tr. K. GEO. III. b. 1738.	Sets.		0	A	9
25	5	A	From the D. o' H. T. in 15 Days	9	A	36	1	12
26	6	Tu	Folkingham, Linc. Lenham, Kent.	10	16	2		13
27	7	W	Montgomery, Stow-in-Guillam, Suff.	10	46	3		11
28	8	Th	St. Germans, Cornwall.	11	9	4		4
29	9	F	Hadde-field, Suff.	1	29	4		51
30	10	S	Prs. AMELIA SOPHIA born, 1711.	11	47	5		37
31	11	A	3 S. aft. Trin. St. Barnabas, A. & M.	Morn.	6	22		
1	12	M	From the D. of the H. T. in 3 weeks.	0	4	7		4
2	3	Tu	Kedderminster, Worc. Manhemot	0	20	7		48
3	14	W	Term Ends. Banger, Cornwall.	0	40	8		32
4	15	Th	Royston, Somersetsh.	1	3	9		18
5	16	F	Milborn Port, Som. Wrexham, Den	1	31	10		5
6	17	S	St. Alban, Mart. St. Alban's, Hertf.	2	3	10		53
7	18	A	4 Sunday after Trinity.	2	45	11		42
8	19	M	Ingleton, York.	Rises.			Morn.	
9	20	Tu	Transl. of Edw. K. of West. Sax.	9	A	8	0	31
10	21	W	Oris. amp. 42° 32' O due E. 7h. 16'	9	37	1		20
11	22	Th	Longest Day at Lond. 16 h. 26 m	9	59	2		7
12	23	F	Armington, Devonshire. (Fast	10	20	2		53
13	24	S	St. John Baptist. Midsummer-Day	10	38	3		37
14	25	A	5 Sunday after Trinity.	10	57	4		23
15	26	M	Chapel Silver, Kent. Penshoore, Wor.	11	14	5		9
16	27	Tu	Boston, Lin. Burton upon Trent, Staff.	11	34	5		57
17	28	W	Folkestone, K. Stow Green. (Fast.	Morn.	6	48		
18	29	Th	St. Peter, Ap. & M.	0	1	7		40
19	30	F	Bridgenorth, Shropshire.	0	35	8		38

M	D	☉ Rise	☉ Set	☾ Sets	♂ Sets	♂ Sets	♀ Sets	♀ Sr.		Cl. aft. ☉
1	3	53	3 7	10 A 42	3 M c	11 A 22	8 A 30	No real	2' 41"	
6	3	49	3 11	10 24	2 30	11 9	Rises	Night;	1 52	
11	3	46	3 14	10 6	2 18	10 46	3 M 0	but ali	0 55	
16	3	44	3 16	9 48	1 57	10 33	2 45	Twil-	0 bef. 7	
21	3	43	3 17	9 30	1 36	10 25	2 30	light.	1 10	
26	3	44	3 16	9 10	1 15	10 18	2 15		2 15	

JULY hath xxxi Days.

IM ☉ Dec.
D North.

New Moon the 3d	} Day at {	40 m. past 3 in Aftern.	5	23°	1'
First Quarter the 10th		42 m. past 6 in Even'g.	6	22	42
Full Moon the 18th		Half past 10 at Night.	11	22	6
Last Quarter the 26th		7 in the Morning.	16	21	21
			21	20	26
			26	10	23

20	1	S	Workup, Not. Tisbury-Abbey, Ely.	IM	17	9	M	39
21	2	A	6 Sunday after Trinity.	2	15	10		44
22	3	M	Dereham, Norf. Shrewsbury.	Sets	11			48
23	4	Tu	Transf. of S. Mart. B. and C.	8A	38	0	A	49
24	5	W	Old Midsummer Day. Leicester.	9	6	1		46
25	6	Th	Lancaster Liverpool, L. Winborn.	9	27	2		39
26	7	F	Tho. à Becket. Chipping-Norton.	9	47	3		26
27	8	S	Folkstone, Kent. Machynleth, Mont.	10	5	4		12
28	9	A	7 Sunday after Trinity.	10	21	4		55
29	10	M	Mansfield, Not. Bolton, Lanc.	10	41	5		39
30	11	Tu	Peterborough, Nor. Mountsorrel, Leic.	11	3	6		24
1	12	W	Canterbury, Kent. Carshalton Sur.	11	27	7		9
2	13	Th	Congleton, Chesh. Huntingdon.	11	59	7		5
3	14	F	Days decr. 21 min.	Morn.	8			4
4	15	S	Swithun, B. of Wicch. Transf.	0	38	9		32
5	16	A	8 Sunday after Trinity.	1	26	10		21
6	17	M	Belt, Breck. Leek, Staff.	2	21	11		11
7	18	T	Exeter, Devon. Huntingdon.	Rises	11			50
8	19	W	Kenninghall Norfolk	8A	2	Morn.		
9	20	Th	Margaret V. and M. Antioch.	8	23	0		46
10	21	F	Alfreton, Derb. Fotheringha.	8	42	1		3
11	22	S	Queen of DENMARK born 1751.	9	0	2		10
12	23	A	9 Sunday after Trinity.	9	19	3		4
13	24	M	Faringham, Kent.	9	38	3		54
14	25	Tu	St. James, A. and M. Bristol.	10	3	4		46
15	26	W	St. Anne, Mother to the B. V. M.	10	32	5		3
16	27	Th	Healdon, York. Milson, W. Porstun, H.	11	10	6		27
17	28	F	Eemlin, Worc. Winchomb, Glouc.	11	59	7		2
18	29	S	D. 15 h. 32 m. long. Short. 1 h. 2 m.	Morn.	8			2
19	30	A	10 S. after Trin. Dog-Days beg.	1	2	9		28
20	31	IM		2	17	10		3

MD	☉ Rises	☉ Sets	h Sets	h Sets	♂ Sets	♀ Rises	DBreak	Cl. b. ☉
1	3 46'	8 14	8 A 50	0 M 52	10 A 4	2 M 2	No	3' 15'
6	3 49'	8 11	8 20	0 31	9 49	1 50	Night,	4 9
11	3 53'	8 7	Rises	0 10	9 34	1 38	but	4 54
16	3 58'	8 2	3 M 30	11 A 49	9 19	1 26	Twil.	5 28
21	4 47	56 3	23	11 28	9 4	1 14	lght.	5 50
26	4 11	7 49	16	11 6	8 50	1 2	0 52	5 5

AUGUST hath xxxi Days.

				M	☉	Deci.
				D		North.
New Moon the 1st	} Day at	50 m. past 11 at Night.		1	17°	57
First Quarter the 9th		54 m. past 10 M. rn.		6	16	38
Full Moon the 17th		a Quarter past 11 Foren.		11	15	11
Last Quarter the 24th		20 m. Afterno n.		16	13	38
New Moon the 31st		34 m. past 9 Morn.		21	12	0
				26	10	18

21	1	1	Lammas-Day. <i>Bath, So. Loughbro'</i> .	3M	39	11	M	30
22	2	W	Winchester, Hamp. Northwich, Ch.	Sets	0	A	23	
23	3	Th	Carnarvon Daventry. Redruth.	7A	49	1		13
24	4	F	Epsom, Surrey. Ravenslase, Cumb.	8	7	2		2
25	5	S	Derby. Doncaster. Stamford, Linc.	8	26	2		47
26	6	A	11 Sunday after Trinity.	8	44	3		32
27	7	M	Name of Jesus. <i>Boston, Linc.</i>	9	6	4		16
28	8	Tu	Furze, Corn. Ruthin, Denb.	9	30	5		2
29	9	W	Llanwst, Denb. Skirkin, Midd.	9	59	5		49
30	10	Th	St. Laurence, Arch D. of R. & M.	10	35	6		39
31	11	F	Prs of BRUNSWICK born 1737.	11	20	7		27
A	12	S	Pr of WALES b 1662 Old Lam.D.	Morn.	8			18
2	13	A	12 Sunday afte. Trinity.	0	13	9		0
3	14	M	Stow, Suffolk.	1	11	9		50
4	15	Tu	Bakewell, Derb. Northampton.	2	21	10		44
5	16	W	Pr. FRED. B. of Olnab. b. 1763.	3	32	11		30
6	17	Th	Bardney, Hampsh.	Rises		Morn.		
7	18	F	Days decreased 2 h. 10 m.	7A	9	0		16
8	19	S	Dartington, Devonshire.	7	28	1		6
9	20	A	13 Sunday after Trinity.	7	48	1		52
10	21	M	Prince WILLIAM born, 1765.	8	12	2		42
11	22	Tu	Bracknall, Berks. Penkridge, Staff.	8	40	3		32
12	23	W	Belton, North. Dinton, Oxt. (Feet).	9	15	4		28
13	24	Th	St. BARTHOLO. Ap. and M.	10	1	5		23
14	25	F	Melver. Som. Llanerchemith, Angl.	10	57	6		2
15	26	S	Carlisle, Cumb. Huntingdon.	Morn	7			23
16	27	A	14 Sunday after Trinity.	0	6	8		23
17	28	M	St. An. B of Hip. C. D.	1	23	9		21
18	29	Tu	Reheading of John Bapt.	2	40	0		15
19	30	W	Barnham, Suff for sheep and lambs	4	4	1		8
20	31	Th	Day 12 hour 34 min long.	Sets	11			56

M 1	☉	Kn	☉	Set	R	Rise	Sets.	☉	Set	☉	Rises	DBreak	Ch. bet. ☉		
1	4	26	7	40	2M	12	0A	44	8	A3	7	cM	52	1M23	5 47"
6	4	27	7	35	2	30	10	27	8	2	0	54	1	44	5 21
11	4	35	7	24	2	24	10	9	8	1	0	53	2	14	4 41
16	4	44	7	15	2	9	9	51	8	0	0	55	2	10	3 48
21	4	53	7	6	1	49	9	33	7	45	0	57	2	35	2 41
26	5	26	57	1	38	9	16	7	30	1	0	2	50	1	22

SEPTEMBER hath xxx Days.

M^o Dec^r.
D North.

First Quarter the 8th
Full Moon the 15th
Last Quarter the 22d
New Moon the 29th

Day at { a quart. past 5 Morn.
36 m. past 10 at Night.
10 m. past 6 in Even.
10 m. past 10 at Night.

1 30 9'
6 5 18
11 4 24
16 2 29
21 0 32
26 1 S. 25

2	1	F	iles, Abbot. Northmore, Wilts.	6	A	36	0	A	44
22	2	S	Richmond-Road, Northum.	6	5	6	1	30	
23	3	A	15 Sunday after Trinity.	7	16	2	16		
24	4	M	Bartholomew's, Lond. Monmouth.	7	40	3	3		
25	5	Tu	Botley, Ham. Chipping-Norton, Ox.	8	8	3	49		
26	6	W	Folkingham, Linc. Snaith, Yorksh	8	40	4	37		
27	7	Th	Dog Days end.	9	23	5	27		
28	8	F	Nat. B. V. M. Wicksforth, Derb.	10	12	6	16		
29	9	S	Bromsgrove, Worc. Devizes, Wilts.	10	9	7	5		
30	10	A	16 Sunday after Trinity.	Morn	7	55			
31	11	M	Tallowdown, Dorsetshire.	0	12	8	42		
1	12	Tu	Brentford, Mid. Whitehaven, Cumb.	1	31	9	30		
2	13	W	Lon. b. 1560. Tideswell, Derb.	2	34	10	17		
3	14	Th	Holy Cross. Wobourn, Bedf.	3	48	11	4		
4	15	F	City of Durham.	Rises	11	54			
5	16	S	Newcastle, Walsall, Staff.	6	A	2	Morn.		
6	17	A	17 Sunday after Trinity.	6	25	0	43		
7	18	M	Southwark. St. bitch, Camb.	6	52	1	35		
8	19	Tu	Carlisle, Cumb. Northampton.	7	26	2	30		
9	20	W	Ember Week. Manchester, (Fast	8	9	3	27		
10	21	Th	St. MATTHEW, Ap. Ev. and M.	9	3	4	28		
11	22	F	K. GEO. III. and Qu. CHARL. Cr.	10	8	5	27		
12	23	S	Halkin, Wilts. Paincastle, Radnor.	11	22	6	26		
13	24	A	18 Sunday after Trinity.	Morn.	7	24			
14	25	M	Chesterfield, Derb. Denbigh.	0	39	8	17		
15	26	Tu	St. Cyprian, Archb. of Carh. & M.	1	57	9	9		
16	27	W	Derby, lasts three Days. Jer. Rev.	3	15	9	58		
17	28	Th	Gloucester, Tuxford, Nott.	4	31	10	46		
18	29	F	St. MICHAEL. Prs. ROYAL born.	Sets	11	32			
19	30	S	St. Jerom. Wrexham, Dent.	5	A	29	0	A	18

M	D	Q	Rues	Q	Sets	H	Rues	4	Set	5	Set	7	an.	D	an.	Cl.	an.	Q
1	5	14	6	45	1	M	20	8	A	55	7	A	15	1	M	10	3	24"
6	5	23	6	36	1		48	39	7		3	1	20	3	21	2	1	
11	5	33	6	26	0		48	23	6	40	1	30	3	34	3	41		
16	5	43	6	16	0		30	8	7	6	30	1	41	3	44	5	27	
21	5	53	6	6	0		16	7	49	6	20	1	52	3	56	7	10	
26	6	3	5	57	11	A	59	7	34	6	12	2	6	7	8	53		

OCTOBER hath xxxi Days.

M. D. C. LXXI.
South

First Quarter the 8th	} Day at {	half past Midnight.	1	30	2
Full Moon the 15th		15 m. past 9 in Morn.	6	5	19
Last Quarter the 22d		half past 1 in Morn.	11	7	13
New Moon the 29th		43 m. past 1 Afternoon.	16	9	5
			21	10	54
			26	12	39

20	1	A	19 Sunday after Trinity.	5A 52	1A 3
21	2	M	Nottingham, Goof. - F. lasts 8 days for	6 19	1 57
22	3	Tu	cheefe, hops, and all sorts of Cattle.	6 50	2 40
23	4	W	Penkridge, Staff. Bridgewater, Som.	7 29	3 28
24	5	Th	Llanvilling, Montg Lampport, Som	8 15	4 17
25	6	F	Faith, V. and M. Hull, Yorksh.	9 7	5 6
26	7	S	Alf. etcn. Der. for horses, cheefe, &c	10 6	5 54
27	8	A	20 Sunday after Trinity.	11 13	6 43
28	9	M	St Denys, B. and M.	Morn.	7 30
29	10	Tu	Old Mich. Day. Birmingham, War.	0 23	8 17
30	11	W	Lancaster, Liecester. St. Alban's.	1 35	9 3
1	12	Th	Banbury, Ox. Salisbury, Wilts.	2 50	9 51
2	13	F	Translat. of K. Ed. Dewizes, Wilt.	4 6	10 40
3	14	S	Buttonmgor, Shropsh. Worksop, Not.	5 24	11 30
4	15	A	21 Sunday after Trinity.	Rises Morn.	
5	16	M	Bsworth, Leic. Hey, Breck.	5 A32	0 25
6	17	F	Etheldred. Sheffield, Yorksh.	6 13	1 24
7	18	W	St. LUKE, Evangelist. Radnor.	7 4	2 24
8	19	Th	Market-Harbro', Lei. Oxford. Yarme	8 7	3 25
9	20	F	Asbourn, Derb. Blyth, Not. Hereford	9 20	4 28
10	21	S	Banbury, Oxford. Gainsborough, Li	10 27	5 29
11	22	A	22 Sunday after Trinity.	11 54	6 23
12	23	M	Overfraw, Angl. Ripley, Derb.	Morn.	7 14
13	24	F	Tamworth, Staff. Windsor, Berks.	1 11	8 2
14	25	W	King GEORGE III. Inaug. Crispin	2 25	8 49
15	26	Th	King GEORGE III. Procl.	3 38	9 35
16	27	F	Buckingham, Warwick. (Fast	4 49	10 19
17	28	S	St. SIMON & St. JUDE, Ap. & M.	6 0	11 4
18	29	A	23 Sunday after Trinity.	Sets	11 48
19	30	M	Banbury, Ox. Ely, Cam. Maidenhead	4A 55	0 A38
20	31		Widneth Shrop. Dewizes (Fast).	5 31	1 27

D.	h.	m.	s.	h.	m.	s.	h.	m.	s.	D. break	Cl. aft. 0
1	6	12	5	4	1A 40	7 A1	5 A58	2 M20	4	18	10' 30"
6	6	21	5	37	11 25	7 C	5 40	2 30	4	29	12 0
11	6	32	5	27	11 7	6 40	Rises	2 49	4	39	13 20
16	6	43	5	17	10 50	6 28	5M34	3 4	4	49	14 28
21	6	52	5	10	32	6 12	5 35	3 18	4	59	15 21
26	7	1	5	0	15	5 58	5 36	3 34	5	15	15 56

NOVEMBER hath xxx Days.

174
D. Dec.
South.

First Quarter the 6th	} Day at {	half past 7 at Night.	1 14 [~] 38
Full Moon the 13th		half past 8 at Night.	6 16 11
Last Quarter the 20th		half past 11 Forenoon.	11 17 37
New Moon the 28th		a quarter past 8 Morn.	16 18 55
			21 20 5
			26 21 5

21	1	W	All Saints Day. <i>Newark upon Trent.</i>	6	A 13	2	A 16
22	2	Th	All Souls. <i>Coventry City.</i>	7	4	3	4
23	3	F	On the Mor. of all Souls.	8	2	3	53
24	4	S	<i>Applethaw, Hants.</i>	9	5	4	40
26	5	A	24 S. after Trinity. <i>Powder-Plot</i>	10	11	5	26
25	6	M	Term begins. <i>Newcastle, Staff.</i>	11	20	6	12
27	7	Tu	Duke of CUMBERL. born, 1745.	Morn.	6	57	
28	8	W	<i>Bingham, Nott. Colchester, Essex.</i>	0	30	7	44
29	9	Th	<i>Darlington, Durh Stamford, Linc.</i>	1	44	8	30
30	10	F	<i>Rochester. Kent. Ruthin, Denb.</i>	2	59	9	18
31	11	S	S. Martin, Bish. & Conf. <i>Liverpool.</i>	4	18	10	10
N 12	A		25 Sunday after Trinity.	5	39	11	7
2	13	M	On the Mor. of St. Martin. <i>York.</i>	Rises	Morn.		
3	14	Tu	<i>Brecknock, and five following Days.</i>	4	A 50	0	6
4	15	W	Macutus, B. <i>Andover, Hamp.</i>	5	50	1	9
5	16	Th	<i>Gisborough, Yorksh. Welchpool, Shr.</i>	7	3	2	14
6	17	F	Hugh B. of Lin. <i>Launceston, Sheffield</i>	8	20	3	16
7	18	S	In 8 Days of Saint Martin.	9	40	4	14
8	19	A	26 Sunday after Trinity.	0	58	5	7
9	20	M	Edmund, K. & M. <i>Blackney, Glouc.</i>	Morn	5	59	
10	21	Tu	<i>Garstang, Lanc. Lamport, Som.</i>	0	14	6	46
11	22	W	Cecilia Virg. and M. <i>Dover.</i>	1	27	7	31
12	23	Th	St. Clement. <i>Asbampstead, Berks.</i>	2	38	8	15
13	24	F	Days decreased 8 h. 12 min.	3	47	9	1
14	25	S	D. GLOV. bo: In 15 D. of S. Mar.	4	56	9	44
15	26	A	27 Sunday after Trinity.	6	3	10	29
16	27	M	<i>Littlebury, Essex.</i>	7	7	11	17
17	28	Tu	Term Ends. <i>Sheffield, Y. T. Hare.</i>	Sets	0	A 6	
18	29	W	Day 8 h. 12 m. long. (<i>Fast.</i>)	4	A 54	0	54
19	30	Th	St. ANDR. Pts. Dow. <i>W.A. b. 1719</i>	5	45	1	44

M L	☉ Rises	☉ Sets	☾ Rises	☾ Sets	☿ Rises	♂ Rises	♀ Rises	D. rears	Cl. etc.	☉
1	7 12	4 47	9 A 54	5 A 38	6 M 36	3 M 50	5 17	16	14	
6	7 22	4 37	9 29	5 21	6 3	4 45	5 24	16	7	
11	7 29	4 30	9 4	5 4	6 35	4 18	5 32	15	40	
16	7 37	4 22	8 44	4 47	6 34	4 32	5 37	14	51	
21	7 45	4 15	8 24	4 30	6 34	4 46	5 43	13	42	
26	7 51	4 0	8 12	4 12	6 22	5 25	5 40	12	13	

DECEMBER hath xxxi Days.

MO ☉ Dec.
D | South.

First Quar. the 6 th	} Day at {	42 m. past 11 Forenoon.	1 21° 3
Full Mo n the 13 th		27 m. past 6 Morning.	6 23 36
Last Quart. the 20 th		44 m. past Midnight.	11 23 5
New Moon the 28 th		4 in the Morning.	16 23 23
			21 23 29
			26 23 22

20	1	F	Rotterham, York. St. Edmond's-B.	6 A 45	2 A 30
21	2	S	Hexne, Suff.	7 54	3 16
22	3	A	Advent Sunday.	9 1	4 2
22	4	M	Atherstone, Warw. Thusk, Yorksh	10 0	4 45
24	5	Tu	Colford, Glouc.	11 18	5 30
25	6	W	Nicol, Bishop of Myra in Lycia.	Morn.	6 12
26	7	Th	Days decreased 8 h. 38 m.	0 30	6 59
27	8	F	Concept of V.M. Boston, Lincoln.	1 45	7 48
28	9	S	Bradford, Wilts.	3 2	8 39
29	0	A	2 Sunday in Advent.	4 23	9 36
30	11	M	Preson, Lanc. Rochester, Kent.	5 45	10 37
D	12	Tu	Bedal, Yorksh Shrewsbury.	7 11	11 40
2	13	W	Lucy, V. & M. cel. D v f. at 6 M	Rises	Morn.
3	14	Th	Pain asfle, Radnor.	5 A 42	0 45
4	15	F	Namptwich, Chesh.	7 4	1 46
5	16	S	O Sapientia. Pocklington, Yorksh.	8 27	2 45
6	17	A	3 Sunday in Advent.	9 47	3 38
7	18	M	Spalding, Lincolnsh.	11 3	4 30
8	19	Tu	Bedford. Northampton.	Morn.	5 16
9	20	W	Ember We-k. (Fast)	0 16	6 1
10	21	Th	St. THOM. Ap. & M.	1 26	6 46
11	22	F	Great. dec of D. at Lon. is 8 h. 50'	2 35	7 30
12	23	S	At Nottingham 9 h. 25 m.	3 43	8 16
13	24	A	4 Sunday in Advent.	4 47	9 3
14	25	M	CHRISTMAS DAY.	5 48	9 51
15	26	Tu	St. Stephen. 1 Mart.	6 42	10 38
16	27	W	St. JOHN, Ap. & Ev.	7 28	11 26
17	28	Th	Holy Innocents. Bridgewater, Som	Sets	0 A 14
18	29	F	Cockbill, Som.	5 A 32	0 59
19	30	S	Maiden Bradley, Wilts.	6 38	1 47
20	31	A	1 Sunday after Christmas.	7 45	2 31

1 D	☉ Rises	☉ Sets	☿ Rises	☿ Rises	♂ Rises	♀ Rises	Dbreak	Cl. aft ☉
1	7 57	4 3	7 A 45	Rises	6 M 31	5 M 17	54 10'	25''
6	8 1	3 58	7 26	7 M 12	6 30	5 35	56 8	21
11	8 5	3 55	7 3	6 57	6 28	5 45	58 6	6
16	8 7	3 53	6 40	6 42	6 24	6 06	0 3	42
21	8 8	3 52	6 17	6 27	6 22	6 10	6 1	obs 20
26	8 7	3 53	5 54	6 12	6 10	6 20	0 1	20

A TABLE of all the **KINGS** and **QUEENS** of *England, since the Conquest.*

The Year of the Birth of each King and Queen; also the Year, Month, and Day, whereon they began to reign: beginning the Year the first Day of January, 1769.

Names.	Born.	Began to Reign.	Y.	M.	D.	The Length of each Reign.	The Year expired since each Reign ended.	since
William Conq.	1027	1066	October	14	20	10	26	108
William Rufus	1057	1087	Septem.	9	12	10	24	166
Henry I.	1068	1100	August	2	35	4	0	134
Stephen	1105	1135	Decem.	1	18	10	23	165
Henry II.	1132	1154	October	25	34	8	11	180
Richard I.	1156	1189	July	6	9	9	0	170
John	1166	1199	April	6	17	6	13	153
Henry III.	1207	1216	October	19	56	1	0	97
Edward I.	1239	1272	Novem.	16	34	7	21	162
Edward II.	1284	1307	July	7	19	6	13	142
Edward III.	1312	1327	January	20	50	5	1	192
Richard II.	1366	1377	June	21	22	3	8	170
Henry IV.	1367	1399	Septem.	29	13	5	21	156
Henry V.	1389	1413	March	20	9	5	11	141
Henry VI.	1421	1422	August	31	38	6	4	110
Edward IV.	1442	1461	March	4	22	1	5	189
Edward V.	1471	1483	April	9	0	2	13	126
Richard III.	1443	1483	June	22	2	2	0	124
Henry VII.	1457	1485	August	22	23	8	0	128
Henry VIII.	1492	1509	April	22	37	9	6	117
Edward VI.	1537	1547	January	28	6	5	8	110
Mary I.	1516	1553	July	6	5	4	11	111
Elizabeth	1533	1558	Novem.	17	44	4	7	66
James I.	1566	1603	March	24	22	0	3	144
Charles I.	1600	1625	March	27	23	10	3	20
Charles II.	1630	1649	January	30	36	0	7	84
James II.	1633	1685	February	6	4	0	7	83
{ William III.	1650	1689	Feb.	13	13	0	23	67
{ Mary II.	1662							
Anne	1665	1702	March	8	12	4	24	55
George I.	1660	1714	August	1	12	10	10	42
George II.	1683	1727	June	11	33	4	3	9
George III.	1738	1760	October	25	when God preserve			

A Compendious TABLE of INTEREST,
Shewing the Interest of any Sum of Money, from a Million
to a Pound; for any Number of Days, at any Rate o
Interest.

N ^o	l.	s.	d.	q.	N ^o .	l.	s.	d.	q.
1000000—	2739	14	6	0,99	1000—	2	14	9	2,14
900000—	2465	15	0	3,29	900—	2	9	3	3,12
800000—	2191	15	7	1,59	800—	2	3	10	0,11
700000—	1917	16	1	3,89	700—	1	18	4	1,10
600000—	1643	16	8	2,19	600—	1	12	10	2,80
500000—	1369	17	3	0,49	500—	1	7	4	3,70
400000—	1095	17	9	2,79	400—	1	1	11	0,50
300000—	821	18	4	1,09	300—	0	16	5	1,40
200000—	547	18	10	3,40	200—	0	10	11	2,30
100000—	273	19	5	1,70	100—	0	5	5	3,10
90000—	246	11	6	0,32	90—	0	4	11	30,71
80000—	219	3	6	0,96	80—	0	4	4	2,41
70000—	191	15	7	1,59	70—	0	3	10	0,11
60000—	164	7	8	0,22	60—	0	3	3	1,81
50000—	136	19	8	2,85	50—	0	2	8	3,51
40000—	109	11	9	1,48	40—	0	2	2	1,21
30000—	84	3	10	0,11	30—	0	1	7	0,90
20000—	54	15	10	2,74	20—	0	1	1	0,60
10000—	27	7	11	1,37	10—	0	0	6	2,30
9000—	24	13	1	3,23	6—	0	0	5	3,67
8000—	21	18	4	1,10	8—	0	0	5	1,04
7000—	19	3	6	2,96	7—	0	0	4	2,41
6000—	16	8	9	0,82	6—	0	0	3	3,78
5000—	13	13	11	2,58	5—	0	0	3	1,15
4000—	10	19	2	0,55	4—	0	0	2	2,52
3000—	8	4	4	2,0,41	3—	0	0	1	3,89
2000—	5	9	7	0,27	2—	0	0	1	1,26
1000—	2	14	9	2,14	1—	0	0	0	2,63

R U L E.

Multiply the Sum by the Number of Days; and that Product by the Rate per Cent. Then cut off the two last Figures to the Right Hand, and the rest you must find in the Table.

Example, What is the Interest of 100 l. for 365 Days at 5 per Cent.

N^o. of Days 365

multiply by 100

Product 36500

multiply by 5 Rate p. Cent.

1025,00

And against

Then in the Table

against 1000

2 14 9 2,14

800 } is 2 3 10 0,11

20 } 0 1 1 0,60

5 } 0 0 3 1,15

Ans. 5 0 0 0,00

Continuation of the Rev. Mr. SMITH's Letter to the
AUTHOR.

Reflex. 9. Moreover the Time of the Earth's passing over $DA B'$ in our Summer, was $81 d. 10 h. 40 m. 35''$; but in Winter it described an equal Angle from H to I in $76 d. 12 h. 53 m. 21''$; consequently, even granting the Orbit to be a Circle, and her Motion uniform, the Distances cannot remain the same; or, if they do, the Motion then cannot be uniform, but accelerated in describing HPI ; wherefore, since the Orbit has been proved an Ellipse, this Phenomenon arises both from a nearer Distance and an Acceleration, amounting together nearly to a fifteenth Part of the whole; of which Reality our Antipodes must inevitably be as sensible in *December*, or their Summer, as we in our Winter.

Reflex. 10. The observed angular Velocities are not in inverse Ratio of the different Diameters of the Sun, so that the Inequalities of the Earth's Motion are not barely apparent, and caused only by a Change in the Distance from the Sun; for if they were, then it would be as $31' 36'', 89$, the observed Diameter at A : $7' 9'', 076$, the Velocity there, :: $32' 42'', 18$, obs. Diam. at P : $7' 23'', 845$, the Velocity there; but it was observed $7' 38'', 621$; whereby it clearly follows, that the Motion of the Earth is really accelerated as she approaches the Sun, again shewing the Truth of the Retardation in the first Reflexion.

§ 4. Here is an Affirmation without any Manner of Proof, and again too hastily concluded from the Mean of Effects: Indeed their Seasons are always at opposite Times with ours; yet as they are nearer the Sun, from what has already appeared, in their Summer at ϖ , and farther off in their Winter at ϖ' , than we are in ours at ϖ and ϖ' , and both of us, at the same Season, receiving the Rays of the Sun at the same Angle, their Summer must be hotter, and Winter colder, than ours; so that a Medium of Heat and Cold, between us and them at any Time, either in the same or opposite Seasons, cannot be at the Equator, except in the Equinoxes; for as they enjoy the Extremes of both in a greater Degree than we do, this Mean will at all other Times incline towards them, and be on the South Side of the Equator; the Heat on the South Side while the Cold is on the North, and *vice versa*: Now then, if these two Means of Heat and Cold thus alternately pass the Equator to a considerable Distance on either Side, describing, as it were, a Zone, the *Equatorians* do undoubtedly undergo different Degrees of Heat and Cold; insomuch that the Effects of a *Thermometer* exposed to the Beams of a clear Sun, abstracting from subterraneous Heats, or rather, in some Measure to prevent this Impediment, a double Convex Lens, applied with like Circumstances, to the *Thermometer*, would not only be very different in different Seasons there; but always much greater (from the Point of Temperate) with our Antipodes than with us, in like Seasons: This, however, I have great Reason to believe from the Accounts given by Naturalists, Historians, and Travelers, that I have met with in the Course of my Reading: Be this as it will, the Answer to the next Paragraph will afford another strong Inference in Proof of it,

B

§ 5. I have

18 The Rev. Mr. SMITH's Letter continued.

§ 5. I have frequently taken the labouring Oar out of his Hands, to prove several Negatives, and now I answer in the Affirmative to his two Questions here put in the Negative; it is more immediately incumbent upon me to prove it; which I shall endeavour by returning back and continuing our Reflections: But why he asks two Questions is not within my Comprehension, because the one includes the other; however, I shall address myself to both.

Reflex. 11. The two Points $\gamma \underline{\omega}$ are agreed and fixed upon by Astronomers for the Limits or Boundaries of Summer and Winter; thus, when the Earth is at $\underline{\omega}$, Summer begins, and continues till it has passed by ω to γ , where and when Winter commences, and continues till it has passed by $\underline{\omega}$ and arrived again at $\underline{\omega}$; and because the Sun is then vertical at the Equator, and the Days and Nights every where equal, they have obtained the Name of the two Equinoctial Points. Now the Day begins at the North Pole, and an *Equatorian* to have the Sun on the North Side of his Zenith, when the Earth is at $\underline{\omega}$, and both continue during the Time of describing $\underline{\omega} \omega \gamma$, when the Day at the South Pole, and the Sun on the South of the said Zenith commence, and continue till it has arrived again at $\underline{\omega}$: But I have manifestly shewn that, it describes the greatest Half $\underline{\omega} \omega \gamma$ with a retarded, and the lesser $\gamma \underline{\omega} \underline{\omega}$ with an accelerated Motion; so that, for these two joint Reasons, the Affirmative of his Questions is, not only reasonable, but really true in Effect: And the Quantity is had from the Time of the Observations at γ and $\underline{\omega}$, between which are 178 d. 18 h. 8' 35"; this doubled and subtracted from 365 d. 5 h. 48'. 56'', a tropical Year, there will remain 7 d. 17 h. 31' 46'', for the Time an Inhabitant at the North Pole has his Day longer than one at the South Pole; or a Resident at the Equator has the Sun more on the North than on the South Side of his Zenith, or our Summers exceed our Winters. Which likewise is a Manifestation of what is in Answer to the last Paragraph.

§ 6. The whole Diameter of the Earth's Orbit, about 162 Millions of Miles, subtended an Angle at the fixed Stars of about 47'', called the annual Parallax, in the last Age; but in the present, by more accurate Observations, it is found not to exceed 3 or 4''; nay, some make it only one Second, so that 64 Millions of Miles at the Stars, the Distance of his two parallel Lines, can subtend an Angle of no more than about one single Second at the Earth; and a little Practice would soon shew what great and insuperable Difficulties attend the Certainty of measuring so small an Angle, even with the best Instruments, especially in taking Amplitudes, where so many Impediments interpose: From whence we may conclude, that if what he says is true, as I believe it is, yet the Effect cannot be made to appear; and the whole amounts to no more than dividing a Hair into a thousand Parts.

§ 7. Let the Orbit turn upon the two Points $\gamma \underline{\omega}$ as an Axis; $\underline{\omega} \omega \gamma$ below and $\gamma \underline{\omega} \underline{\omega}$ above, making an Angle of 23° 29' with the Plane of the Paper being in the Plane of the Equinoctial, the Orbit will be in that of the Ecliptic, and $\gamma S \underline{\omega}$ their common Intersection: let us also imagine, for the better conveying our Ideas, a Plane always perpendicular to the Plane of the Paper passing through S the Sun and the Earth,

Earth, which is therefore the Plane of the Solar Meridian ; this moving uniformly in the Equinoctial from \mathcal{W} with the mean Motion of the Earth, will describe the Base of a right angled Spherical Triangle on the Paper, and the Hypothenuse in the Orbit : which is less than the Base all the Way to \mathcal{V} , because the remaining part from \mathcal{V} is, by the Rules of Trigonometry, greater than that of the Base : at a , the Middle between \mathcal{W} , \mathcal{V} , it sustains a Loss or Defect of no less than $2^{\circ} 28' 25''$, almost $9^{\circ} 54''$ of Time ; from whence it increases, and both become 90° at \mathcal{V} ; thence the Augmentation continues to β , the Middle between \mathcal{V} \mathcal{E} , and there acquires an Excess of the same $9^{\circ} 54''$ which it again loses in going to \mathcal{E} , and both there become 180° . So in the other half $\mathcal{E} \approx \mathcal{W}$ Now equal or mean Time is always measured by this equable Motion upon Paper or Equinoctial, and the apparent by that in the Orbit or Ecliptic, which, in other Terms, is, the right Ascension in the Equinoctial, and Longitude in the Ecliptic ; both these evidently agree in \mathcal{W} , \mathcal{V} , $\mathcal{E} \approx$; but since the Plane passes over any certain Portion of the Equinoctial before a like in the Ecliptic from \mathcal{W} to \mathcal{V} , and from \mathcal{E} to \approx , the apparent Time is there too slow ; and, on the contrary, it arrives at any given Point of the Ecliptic from \mathcal{V} to \mathcal{E} , and from \approx to \mathcal{W} , sooner than at one in the Equinoctial, equally distant from the same Points \mathcal{V} , \approx ; the apparent is then too fast. This Equation, arising from the Inclination of the Ecliptic to the Equinoctial, was first brought into Calculation by *Tycho Brabe*, and thence called the *Tychonic* Equation : which the sagacious *Kepler* found not always to correspond with his Observations ; and, after he had discovered the planetary Orbits to be elliptical, added therefore another Equation, arising from the Inequality of the Earth's Motion in her Orbit, which Inequality has manifestly appeared from our Observations ; we now will consider *this* apart with respect to the Case before us, by comparing the true Motion of the Earth in her Orbit with the mean. Suppose both to commence at A , where the true begins to decrease from the mean, it will have lost at r $1^{\circ} 55' 29''$, or $7' 42''$ of Time (see Reflex. 6) where it begins to increase upon the mean, gains the former Defect of $7' 42''$ at R , where it again begins to decrease from the mean, and losing this Excess, again becomes equal to the mean at A : whereby it is evident, the Plane will, in its Revolution, first arrive at the true Motion in the Orbit, in going from A \circ r and from R to A ; therefore the apparent is there too fast. On the contrary, in going from r by P to R , it will first pass the mean Motion ; the apparent therefore is here too slow ; so that if this Equation of the Orbit, called the *Prosthapheresis*, alone obtained, apparent Time would agree with the mean only twice in the Year, *viz.* when the Earth was at A and P , as this Gentleman asserts from his peculiar Notions and Reasonings for a Mean between the Extremes : But since these two Equations are the Productions or Effects of only one single Motion of the Earth in her Orbit, neither of them can take Place without the other ; and must, therefore, be jointly considered as acting together, and the Equation thence arising will shew the true Difference between apparent and mean Time ; wherefore, once more sending the Plane round from A , attended with both these Irregularities, it will, from a little Consideration, appear, that

it is at	$\left\{ \begin{array}{l} a \\ \gamma \\ \text{B} \\ \text{P} \\ \text{R} \\ \delta \\ \text{b} \end{array} \right\}$	$\left\{ \begin{array}{l} 954 \\ 000 \\ 000 \\ 366 \\ 239 \\ 954 \\ 000 \end{array} \right\}$	$\left\{ \begin{array}{l} \text{too fast,} \\ \text{too slow,} \end{array} \right\}$	accord. to the first, or <i>Tycho's</i> Equat. And	$\left\{ \begin{array}{l} 430 \\ 738 \\ 112 \\ 000 \\ 742 \\ 610 \\ 19 \end{array} \right\}$	$\left\{ \begin{array}{l} \text{too fast,} \\ \text{too slow,} \end{array} \right\}$	accord. to the second Equation, or Protha- phersis, so that the apparent Time is	$\left\{ \begin{array}{l} 524 \\ 738 \\ 112 \\ 366 \\ 430 \\ 344 \\ 19 \end{array} \right\}$	$\left\{ \begin{array}{l} \text{too slow.} \\ \text{too fast.} \\ \text{too fast.} \\ \text{too slow.} \\ \text{too slow.} \\ \text{too fast.} \\ \text{too slow.} \end{array} \right\}$
Whereby it evidently follows, that some- where between	$\left\{ \begin{array}{l} a \\ \text{B} \\ \text{R} \\ \delta \text{ b} \end{array} \right\}$	$\left\{ \begin{array}{l} \gamma \\ \text{P} \\ \delta \end{array} \right\}$	$\left\{ \begin{array}{l} \text{the Excess of one,} \\ \text{and the Defect of} \\ \text{the other counterba-} \\ \text{lance, and the ap-} \\ \text{parent; therefore} \\ \text{consequently agrees} \\ \text{with the mean; } \\ \text{which happens a-} \\ \text{bout the} \end{array} \right\}$						$\left\{ \begin{array}{l} 31^{\text{st}} \text{ of } \textit{August.} \\ 24^{\text{th}} \text{ of } \textit{December.} \\ 15^{\text{th}} \text{ of } \textit{April.} \\ 16^{\text{th}} \text{ of } \textit{June.} \end{array} \right\}$

Hence four Times a Year, according to our System, doth the Sun and Clock shew the same Time, without the Earth being twice in Ayhelion and Perichelion, to which Absurdity he has laboured to reduce it, but without Success, and his wonderful Reasoning for a Mean again fails: Indeed the Admission of supposing both the true and mean Motions to commence from A, as above, rather than from any other Part of the Orbit, may afford some Objections; but I shall desist from giving their Answers till pressed with more Difficulty than at present, presuming it sufficient to remind him; that, as any Quantity or Motion in passing from a Negative to Affirmative, and the contrary, is somewhere equal to nothing, the Difference between apparent and mean Time, in our former Observation, must be nothing somewhere between D, B, $\overline{\text{B}}$, Q and $\overline{\text{Q}}$, γ , P, D respectively, which is very consonant to the Times just now assigned: Beside I have always found this Difference to be just what it should be from an Horizontal Dial, divided into Quarters of Minutes, compared with the Time-piece regulated to mean Time; so that we have the Facts of Nature, and the universal Consent of Astronomers, to support this Supposition.

His reasoning from the absolute Motion of the Earth being faster at P, and slower at A, than mean Time, is not true; for, of two Clocks both going at the same Instant from 12, the one equably, and the other uniformly accelerated, or too fast, from 3 to 9, but as much uniformly retarded or too slow from 9 to 3, will he affirm that this, after one or more Revolutions, is slower at 12, or faster at 6, than the regular one, because the absolute Motion at those Times is so?

If he is for establishing circular Orbits, as appears to me, his Memory must certainly fail him; not only to grant, but say, that the Earth is nearer the Sun and moves swifter at one Time than another is not very consistent with circular Orbits.

§ 8. Notwithstanding this Question is put in the Negative, yet the Affirmative must sufficiently appear from what has just been said, where it was shewn, that Astronomers have considered these very two Circumstances

stances he is so mighty anxious to put them in Mind of, and in the only Manner wherein they can agree with the Phænomena of the Heavenly Motions.

§ 9. As I have not sufficient Penetration to discern wherein the Times of *M. De La Caille* differ from those of other Astronomers (set forth in Answer to the 7th Paragraph), I am, with great Reluctance, drawn into a Necessity of suspecting either this Gentleman's Abilities, or my own, in understanding this Author ; who, indeed, no where particularly treats of, or even mentions, the Equation caused by the Inclination of the Ecliptic to the Equator, yet refers the other, caused by the Irregular Motion of the Earth in her Orbit, to the Motion in the Equinoctial, comparing it with the right Ascension, which at once includes and produces the Effect of both Equations, perfectly agreeing with other Astronomers ; for it amounts to the very same, whether we consider the Irregular Motion of the Earth in her Orbit with Reference to the mean, and then the Irregularity of this mean again to that in the Equator, as I have done ; or, at once, to consider and compare the irregular Motion in her Orbit to that of the right Ascension in the Equinoctial, as this Author has done ; in demonstrating of which, *Mr. Bamfield* will certainly destroy his own System ; and establish the very one he labours to reject : for the Truth of this, and which of us best understands our Author, I do, with great Submission, appeal to every ingenious Artist, of whom I here, once for all, sincerely beg to set me right whenever I shall be in the wrong.

It really gives me some Uneasiness to see the Motion of the Earth, assigned by the present Astronomers, bearing the hard Epithets of "forced," "compounded, and unnatural ;" whereas it is the most easy, regular, simple, and natural, that can flow from the spheroidal Figure of the Earth, perfectly consentaneous to his Notions, "Nature performs all her Operations the shortest and easiest Way" — "There are not many particular Intricacies in the regular Course of Nature ;" and she completely keeps up to *Horace's* — *Simplex duntaxat et unum* ; as will appear to every one that shall have the Happiness of removing the present Partiality, so zealously attached to the most fictitious and inadequate Causes, but, unfortunately Effects of Projection and Attraction in the Heavens, for the Adoption of the real Agents, which God has created to put, preserve, and continue his Machine in Motion.

I heartily wish he would make my Eye-sight as good as his, and see as much ; but till he has brought the Earth into a perfect Sphere, he must expect no small Trouble in accomplishing the Business ; nay, even then I should despair of the physical Causes for such a Motion ; because I firmly believe no such are in Nature, and thereupon confidently affirm he cannot support this extraordinary Assertion, without introducing some hypothetical Data that shall destroy, or, at least, enervate the whole Basis of his Principles.

§ 10. His seventh Paragraph, if I understand his Meaning, is a full and adequate Reply to this. "For, says he, when the Earth is nearest the Sun, she moves faster than equal Time ; and when farthest, slower than mean Time ;" from which different Distances and Degrees of Motion, must inevitably follow the two respective Consequences of the Sun having different apparent Diameters ; and our Summer longer than

22 The Rev. Mr. SMITH's Letter continued.

our Winter, even if the Sun be in the Center of the Earth's Orbit: To affirm these Premises, and deny the r absolutely consequent Effects, with the Evidence of Demonstration, is something wonderful; amounting to nothing less than demonstrating that the apparent Diameter of any given Object is the same at all Distances, viz. Reflex. 8. Will he, in Contradiction to the established Rules of Perspective in one Case, a plain Axiom in Mechanics in the other, and common Sense in both, say, that the visual Angle from a Spire is the same at the Distance of one Furlong as a hundred? and that a Body will pass over an equal, if not a greater Space, with a slow Velocity, in the same Time as another with a greater Velocity?

His resting all Astronomy, and the Objections against his Hypothesis, upon the different apparent Diameters of the Sun, and our Summer exceeding our Winter by 8 Days, certainly proceeds from a Want of due Consideration; for in the first six Reflexions, is determined from Observations, not only the Form but the very Dimensions of the Orbit, with every other Requisite, absolutely and independently of those; viz. Reflex. 7. which only follow as concomitant Proofs in Reflexion 8, 9 and 11. Yet, suppose his Denial of these two Phenomena to be true, his Demonstration of it, if it can be so called, is very deficient, and comes now to be examined.

* * * To be concluded in the next Year's DIARY.

The Rev. Mr. SMITH's Errata of that Part of his Letter published last Year.

Page 18, Line 13, after *witness add it*; Page 19, Line 47, for *to* read *to*; Line 49, for *but the*, read *but this*; Page 23, Line 1 and 2, for *that Object*, and *place another of the same Magnitude at*, read *it to*; Line 2, for *this*, read *the same Object*.

In the Table of Observations.

Line A, Col. 2, for $29' 38''$ r. $21' 28''$; next, for $24' 1''$ r. $25' 9''$; Col. 5, for $28' 1''$ r. $38' 1'' = 6$; Col. 2, for $28' 1''$ r. $38' 1''$.

Conclusion of Mr. WILLIAM CHAPMAN's Tables of the Solar Eclipses, which will be visible in England till the Year of our LORD 2000.

	Begin.	Midd.	End.	Durat.	Digits
	h' "	h' "	h' "	h' "	o' "
1919. Nov. 22, After.	3 20 3	4 17 32	5 10 32	1 50 c	3 0 0
1920. Nov. 10, After.	3 53 c	5 1 36	6 3 36	2 10 30	7 3 0
1921. April 8, Morn.	7 39 1	8 52 51	10 9 31	2 33 30	0 48 0
1922. March 28, After.	1 15 2	2 8 55	2 59 25	1 44 c	2 16 0
1925. Jan. 24, After.	2 47 20	3 52 49	4 54 9	2 6 40	10 0 0
1927. June 29, Morn.	4 29 11	5 24 41	6 25 41	1 56 30	11 6 0
1928. Nov. 12, Morn.	7 47 4	8 35 4	9 27 4	1 40 c	2 42 0
1929. Nov. 1, Morn.	10 59 16	11 36 6	12 10 36	1 11 20	0 59 0
1936. June 19, Morn.	3 55 40	4 42 10	5 32 10	1 36 30	6 42 0
1939. April 19, After.	5 32 52	6 24 22	7 12 52	1 40 c	4 42 0
1942. Sept. 10, After.	3 26 6	4 14 36	5 0 6	1 34 c	3 54 0
1945. July 9, After.	12 47 5	2 2 7	3 13 57	2 26 c	7 49 0
1949. April 23, Morn.	6 44 44	7 40 44	8 41 35	1 56 50	4 27 0

1952,

The GENT. Diary; or, Math. Repository. 23

1952, Feb. 25, Morn.	8 38 8	9 11 38	9 46 8	1 8 c	1 29 °
1954, June 30, Morn.	11 20 2	12 38 32	2 11 2	2 51 c	9 39 °
1959, Oct. 2, Morn.	11 26 1	12 24 1	1 21 31	1 55 3c	4 5 °
1961, Feb. 15, Morn.	6 39 10	7 40 40	8 46 40	2 7 30	11 25 °
1966, May 20, Morn.	8 33 7	9 36 7	10 43 7	2 10 0	5 17 °
1968, Sept. 22, Morn.	9 30 18	10 27 18	11 27 48	1 57 30	4 7 °
1971, Feb. 25, Morn.	8 37 38	9 41 8	10 43 38	2 11 c	7 54 °
1972, July 10, After.	7 37 52	8 21 22	9 32 2	1 25 30	6 4 °
1973, Dec. 24, After.	3 10 6	4 19 36	5 22 36	2 12 30	5 56 °
1975, May 11, Morn.	5 38 26	6 34 56	7 34 26	1 56 0	6 48 °
1976, April 2, Morn.	9 42 c	10 19 0	10 51 c	1 9 0	1 2 °
1982, Dec. 15, Morn.	7 23 28	8 29 28	9 41 28	2 18 0	5 48 °
1884, May 30, After.	5 24 50	6 23 20	7 17 50	1 53 0	6 19 °
1994, May 10, After.	5 52 31	6 50 31	7 45 31	1 53 0	5 55 °
1996, Oct. 12, After.	1 9 18	2 28 18	3 42 18	2 33 0	7 15 °
1999, Aug. 11, Morn.	9 10 52	10 27 52	11 47 52	2 36 40	11 24 °

Of the ECLIPSES which will happen this YEAR, 1769.

By Mr. Robert Langley, of Hitchin.

While Sol, this Year, through th' 'cliptic strays,

Pale Luna near the same will come,

And three Times intercept the Rays

Diffused by the radiant Sun :

And Luna likewise will appear

(And Opposition fall)

Two Times in Darkness, I declare,

To this terraqueous Ball.

The first is of the Sun, *January 8*, at about half an Hour past 2 in the Morning, consequently invisible

The second will be a visible Eclipse of the Sun, *June 4*, in the Morning; apparent Time, at the Royal Observatory at *Greenwich*, by the *Durham* Tables.

	h	'	"
Beginning	6	37	19
Middle	7	28	32
Visible ☿	7	29	13
End	8	23	10
Digns eclipsed 6° 18' 28"			

REMARK.

The Center of the Penumbra first of all enters the *Globe* in *New Britain*, where the Sun rises centrally and totally eclipsed; and pursuing a North Easterly Direction, leaves that Place near *Button's Island*, at the Entrance of *Hudson's Straights*, passing over *Davis's Straights*, *Greenland*, and the unknown Parts about the *North Pole*: It then takes a South Easterly Course over the *Icy-Ocean*, and the North East Part of *Green Tartary*, leaving it near *Saint Lawrence's Island*, and enters the

24 Of the ECLIPSES this Year. 1769.

Pacific Ocean, where the Center of the Penumbra leaves the Globe, and the Sun is centrally and totally eclipsed at setting.

The third is of the Moon, *June* 19, past 8 in the Morning, invisible.

The fourth is of the Sun, *November* 28, about a Quarter past 8 in the Morning, invisible; by Reason of the Moon's South Latitude.

The fifth and last, is a visible Eclipse of the Moon, on the 13th of *December*, as follows:

	h	'	"	
Beginning	4	57	1	} In the Morning at <i>London</i> .
Middle	6	21	30	
Ecliptic	8	6	27	
End	7	45	59	} Apparent Time, by the <i>Durham</i> Tables.
Duration	2	48	58	
Digits eclipsed				8° 57' 9"

Mr. *William Chapman* sent Calculations of all the Eclipses at large, together with their geographical general Appearances: That of the Sun on the 4th of *June*, in the Morning, at *Foxton* in *Leicestershire*, from the *Durham* Tables, is as follows:

	h	'	"	
Beginning	6	35	27	} Apparent Time.
Visible	7	26	54	
Middle	7	27	17	
End	8	22	47	
Digits				6° 46'

He also sent that of the Moon, on the 13th of *December*, in the Morning, for *Foxton*, from the *Durham* Tables, as under:

	h	'	"	
Beginning	4	53	50	} Apparent Time.
Middle	6	14	50	
End	7	32	50	
Digits				8°

Mr. *John Edwards* also favoured the Author with Computations and Types of the Eclipse of the Sun, on the 4th of *June*, as seen from *Cambridge*.

	H	M	
Beginning	6	40 $\frac{7}{8}$	} Apparent Time
Middle	7	36 $\frac{1}{4}$	
Ends	8	28 $\frac{1}{4}$	} at Cambridge.
Digits		5 $\frac{3}{4}$	

And also that of the Moon, *December* 13, in the Morning.

	H	M	
Beginning	5	6	} Apparent Time
Cent. ingress.	5	47 $\frac{1}{4}$	
Middle	6	25 $\frac{1}{4}$	
Cent. egress.	7	10	} at Cambridge.
End	7	51	
Digits		8 $\frac{2}{3}$	

The GENT. Diary; or, Math. Repository. 25

Mr. William Terrell, of Redruth in Cornwall, sent also the following Calculation of the Lunar Eclipse, for Clowance, the Seat of Sir John Saint Aubin, Bart. and at Redruth.

At Clowance.			At Redruth.			} Apparent Time.
	h	' "	h	' "		
Beginning Dec. 12.	16	50 32	16	51 2		
Middle	18	13 5	18	13 35		
Ecliptic Opposition	18	18 35	18	19 5		
End	19	35 38	19	36 8		
Duration	2	45 6				

Mr. Thomas Atkinson, of Ingham in the Asbes, Lincolnshire, sent the following Calculation of the Solar Eclipse, on the 4th of June, by Ferguson's Tables, as it will appear at Lincoln.

	h	' "	} Apparent Time
1769. June 4. Morn. Beginning	6	39 20	
Middle	7	34 15	
End	8	25 19	
Duration	1	45 59	
	Digits	50 $\frac{1}{2}$	

Together with the Lunar Eclipse, on Dec. 13, in the Morning,

	h	' "	} Apparent Time
Beginning	5	4 20	
Middle	6	23 30	
End	7	43 40	
	Digits	80 7' 52"	

Mr. Richard Rowley, of Kirkby Mallory, in Leicestershire, gives the following Account of the Moon's Eclipse, from Mr. Abraham Lord's MSS. Tables, for Kirkby Mallory.

	h	' "	} Apparent Time
Beginning	4	54 10	
Middle	6	19 10	
End	7	44 28	
	Digits	90 4'	

And Mr. William Phillips, of Silsden, near Skipton in Craven, Yorkshire, sent the following Calculation of the Sun's Eclipse.

	h	' "	} Apparent Time at London.
Beginning June 4. A. M.	6	41 58	
Middle of the Eclipse	7	32 42	
End	8	23 50	
	Digits	60 4' 56"	

Also that of the Moon.

	h	' "	} App. Time at London.
Beginning Dec. 13, in the Morn.	4	57 37	
Middle	6	21 45	
Ecliptic Opposition	6	28 13	
End	7	45 52	
	Digits	80 58' 13"	

Mr.

Mr. *William Chapman* (with Parallaxes from *Halley's Tables*) has been at the Pains to calculate the Transit of *Venus* (with Types) for *London, Petersburg, Manilla, and Boston in New England*: That for *London* is as under:

	h	'	"
App. Time in the Aftern., June 3.	7	27	52
Middle	10	34	54
Central Egress	13	44	28
Sun set	8	h	5' 28"

Mr. *Robert Langley* observes, that this Transit will be visible at *Greenwich*, till after the total Immersion; that at the Middle the Sun will be vertical in Lat. $22^{\circ} 27'$ N. Long. $139^{\circ} 10'$ W. from *Greenwich*, where the Duration will be the shortest. In Lat. $55^{\circ} 44'$ S. and the same Long. its Duration will be the greatest possible.

ANSWERS to the ÆNIGMAS, &c. in last Year's DIARY.

- | | |
|---------------------------|--------------------------------|
| 1. A RAINBOW. | 6. FASHION. |
| 2. DARKNESS. | 7. AN ARROW. |
| 3. LANGUAGE. | 8. A WIND-MILL SAILS. |
| 4. BIRMINGHAM HALF-PENCE. | 9. NEWS. |
| 5. A BIRD'S NEST. | 10. Prize, a Pair of BREECHES. |
| 1. Rebus, A RAKE. | 2. TARRATT. |
| 3. A BEACON. | 4. EXETER. |

Answer to all the Ænigmas by Mr. W. SWIFT; Addressed to Miss *Polly Stow*. BEAUTY and FASHION.

Says *Beauty* to *FASHION*, as they sat at the *Toilette*, 6
 If I give a Charm, you will certainly spoil it;
 'Tis so metamorphos'd by your fiddling and fangling,
 Just like the *Bad HALF-PENCE* we often are handling: 4
 I scarce know my old *BREECHES* when I see them again, Prize:
 (Such Changelings you make, both of Women and Men!)
 For, like *WINDMILL-SAILS* your Head does turn round, 8
 And with a fair *SPEECH* you the World do confound! 3
 Now, What have you done? you'll say full enough,
 For you daub 'em with Gold, fine Lace, and such Stuff:
 Your Head, like the *RAINBOW*, all Colours will bear,
 With Ribbons and Trappings to fly in the Air } 1
 Or, like a *BIRD'S NEST*, close; or ruffled in Hair! } 5
 Without Handkerchief now; then *DARKNESS* with Ruff, 2
 Now plain as a *Quaker*; soon all of a Puff:
 Just like Cock on the Steeple that shews you the Weather,
 You are hardly the same for two Days together:
 You fly swift as an *ARROW* when sent from the Bow; 7
 And change like the *NEWS*.—What think you, *Polly Stow*? 9

Answer to all the Ænigmas by Miss *POLLY STOW*; Addressed to Mr. *W. Swift*. FASHION and BEAUTY.

Miss *FASHION* to *Beauty*; she smiling reply'd, 6
 Who does most for the Sex? Let it fairly be try'd:

The GENT. Diary; or Math. Repository. 27

And they that look round 'em will presently see
 No *Birmingham* HALFPENCE will buy aught for me. 4
 I grant it indeed; mighty Favors you boast.
 But how scanty are they!—How scarce is a *Toast*!
 A Shape, a Complexion, you confer now and then,
 But, to one you give either, you refuse it to ten;
 For, if once you succeed, you much oft'ner do fail
 Here your Rose is too Red; there your Lily's too Pale
 Your Head's full of Conceit, and turns like WIND-MILL SAIL. } 8
 For some Feature or other is always amiss,
 And pray let me know, when you've finish'd a Piece,
 But what I was oblig'd to correct, or touch over,
 Or you never would have either Husband or Lover:
 Tho' your Face (as the RAINBOW) may beauteous appear, 1
 And your Eyes like an ARROW dart all the whole Year; 7
 Yet, I hope (my fair Lady) you do not forget,
 Tho' you find the Thread, that its I make the Net:
 Don't fumble in SPEECH, Miss.—It must be allow'd
 That Woman is nothing—unless A-la mode; 3
 Neglected she lives, and no Beauty avails;
 (For what is a Ship, without Rigging and Sails?)
 You're buried in DARKNESS (my beautiful Miss) 2
 Unless I assist you, you can't deny this:
 Your Nymphs, with their Shapes, Complexions, and Features,
 What are they without me?—but poor awkward Creatures!
 Just like a BIRD'S NEST which unfinished lies,
 Or an old Pair of BREECHES all torn in the Thighs. 5.
 The Rout—the Assembly—the NEWS—will you tell Prize.
 'Tis I form the Beau, and I finish the Belle: 9
 So I think with your Beauty you'd make but bad Shift,
 Unless Fashion attend it—cant it so, Billy Swift.

Friend *Rachell Bell*, of *York*, sent the following general Answer to all the *Ænigmas*, in a Description of a rural Scène.

When *Sol's* blest Radiance paints the orient Skies,
 And gloomy DARKNESS to the Westward flies; 2
 When ev'ry Leaf and Flower's bepearl'd with Dew
 And blooming Verdure decks the Fields anew:
 The feather'd Songster quits his downy NEST, 5
 And with sweet LANGUAGE trills his Brood to Rest; 3
 The RAINBOW's vivid Hues his Plumes adorn. 1
 The beauteous FASHION of the fragrant Morn:
 No NEWS nor Noise disturb the placid Scene, 6
 Nor Storms annoy the MILL-SAILS on the Green: 9
 The Miller thus being disengag'd from Cares;
 To Neighbor *Collin* chearfully repairs,
 With Bow and ARROW, at a Mark they shoot, 7
 And for the Prize most eagerly dispute:
 A Pair of BREECHES, with some HALFPENCE bad, Prize 4.
 The sure Reward is, for the Victor Lad.

Mr.

28 Ænigmas in 1768, answered.

Mr. *Gervas Adams*, of *Alvaston* near *Derby*, sent the Answers to all the Ænigmas, as follows.

The RAINBOW Friend *I angley* endeavors to hide 1
But like *Turner* in DARKNESS I'll never be tied; 2
Then *Wyld's* is good LANGUAGE (which but few understand) 3
And *Hubbard's* BAD HALFPENCE, made ready to's Hand: 4
Next *Vaughan's* a BIRD'S NEST; I plainly do see 5
That *Swift* with the FASHION will always agree. 6
The next is an ARROW (if I hit the Mark still) 7
And *Miss Storr* means the SAILS (I think) of a MILL: 8
Then *Swift* with his second, as swift as NEWS flies; 9
And *West* (with his BREECHES) disguises the Prize. 10

Mr. *John Ramsey* sent the following Answer to the Ænigmas.

When the RAINBOW appears, no DARKNESS can be; 1. 2
Expunge your bad HALFPENCE:—good LANGUAGE for me! 4. 3
Vaughan builds a BIRD'S NEST upon an old Wall; 5
And then makes an ARROW to kill the Birds all. 7
The Coquettes in the FASHION, much NEWS they must tell, 6. 9
With WIND-MILL head SAILS, and Tongues mighty fell, 8
They'll tell you long Stories of Fairies and Witches;
And sometimes who fought the good Man for his BREECHES. Prize.

All the Ænigmas answered by Mr. *James Brown Ashton*, of *Lincoln*.
THE STORM.

Mild was the Eve, and ev'ry Scene was gay,
But lo! as *Phæbus* sunk into the West,
The gaudy RAINBOW his high Throne assum'd, 3
A certain Sign that Storms would soon ensue:
Ev'n so it hap'd, the Skies all cloudy turn'd,
And sable DARKNESS spread its Mantle round, 2
And all was dread;—The Winds began to roar,
And teeming Show'rs of Rain impetuous fell
With rattling Hail—The forked Light'ning shone,
And dreadful Thunders roll'd with awful SPEECH. 3

The heavy Threat'nings of an angry God
Made all afraid; the * BASE degen'rate Man, 4
Or Atheist wild, now own'd the Lord supreme!
The FASHIONABLE Beau, in gaudy † DRESS, 6. Prize
Who just before was boasting of his Pow'r,
Now trembl'ing ran for Shelter to his Head;
Nor Man alone was frail: the Feather'd Race
Flew to their NESTS for Shelter from the Storm, 5
And round the Plain the Beasts all lowing ran.

It now a while subsided, then again
As tho' by Strength renew'd began afresh;
Red fiery Thunderbolts like ARROWS fell 7
And spread with Horror Desolation round.
The Winds as tho' enrag'd vehement warr'd

* *Birmingham Halfpence.*

† Alluding to *Breeches*.

And

The GENT. Diary; or, Math. Repository. 29

And by the Roots tore up some lofty Trees
 And Houses overturn'd, with Steeples high;
 And from each MILL tore off the lab'ring SAIL. 8
 At length its Pow'r declin'd; th' impetuous Rain,
 And rattling Hail, with Thunder's dreadful Sound,
 Entirely ceas'd, and all again was hush'd.
 But here the Terror did not quite decline,
 For, by the weekly News, it was resum'd; 9
 To read the dire Desolation done,
 Might fill each mortal Breast with Dread and Fear,
 And from their Hearts draw unaffected Pray'rs
 That such a Storm may ne'er be felt no more.

All the *Ænigmas* answer'd by Mr. John Colledge, of West Haddon.

Langley has well disguis'd the RAINBOW's Charms, 1
 Turner on DARKNESS ev'ry Bosom warms; 2
 Wild's SPEECH is void of Fiction and Deceit, 3
 But Hubbard's COIN is base and counterfeit: 4
 Vaughan's BIRD's NEST originally shines, 5
 Swift's is the FASHION, in old fashion'd Lines. * 6
 Vaughan again comes arm'd with Cupid's DART, 7
 Polly on WINDMILLS SAILS is sweet and smart: 8
 The Ninth's ambiguous, and compar'd may be
 To Light or Light'ning; News, or Letter T; 9
 Now say, ye Bards of th' Ænigmatic Trade.
 Are not the BREECHES (think you) neatly made? Prize

A general Answer to all the *Rebuses*, by Miss. Polly Ashton, of Savinethorpe.

Not all the Wits that EXETER can boast. 4
 Can vie with TARRAT; He remains the Toast 2
 Of all Diaria's Sons, both gay and sage,
 Which RAKES acknowledge, tho' they're fir'd with Rage; 1
 His Works conspicuous shine, like BEACON's Blaze; 3
 Of all Diaria's Sons, he merits Praise.

Mr. James Mills, of Brixworth, answers all the *Rebuses* in a Father's advice to his Daughter.

Be sure, my Child, to shun a RAKE, 1
 Or you'll repent it when too late;
 A Man of Sense will give you Peace
 (May TARRAT's Friendship never cease.) 2
 If e'er abroad you chance to ride,
 May Truth, like BEACON, be your Guide: 3
 And always Virtue's Ways perfer
 Before the Beans in EXETER. 4

* See the *Universal Magazine* for March 1748.

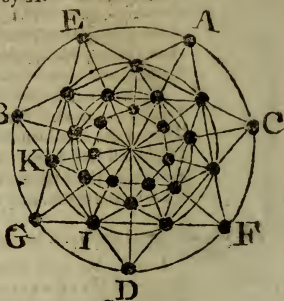
The

30 Paradoxes, Rebuses, Queries, &c. answered.

The PARADOXES answered.

I. Paradox answered by *A. D. Whigham.*

Divide a Circle into seven equal Parts, and draw the chord Lines AB, BD, DC, CE, &c. Then by drawing Chords in the same Manner to the two inward concentric Circles, together with the Lines AI, CK, &c. and it is done.

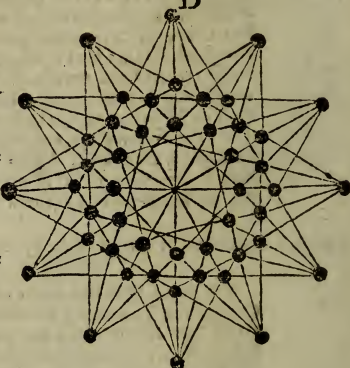


Mr. *Swift*, of *Stow*, also sent a Fig. to solve it.

Mr. *John Colledge* gives the Scheme annexed, in Answer to the second Paradox.

Behold the Scheme, once known to none but you, Stands here exhibited to public View.

No Answers came to the third Paradox.



ANSWERS to the QUERIES.

1. *Query*, answered by Mr. *George Lodge*.

Both Parties, it is certain, distress the Poor greatly; and it is hard to say which does it the most.—Now the Monopolizers oft make a Scarcity in the Midst of Plenty, 'tis true; yet they help the Poor to Corn, tho' at an extravagant Price: whereas, when it is exported, it can yield no Relief to the Poor at any Rate, being quite gone: Wherefore I think these *last* distress the Poor the most; for certainly it is better to have Corn at an advanced Price, than to have none at any Rate.

2. *Query*, answered by Mr. *William Swift* the Proposer.

This Custom, in my Opinion, proceeded at first from observing that Instinct in these sagacious Insects to return to their Hives, when they are out at Labor, at the Approach of a Storm: the Air at that Time undergoing a very sensible Change in its Denseness, they are undoubtedly apprehensive of the approaching Danger, and immediately repair to their Castle of Security.

The

The GENT. Diary; or Math. Repository. 31

The tinkling of a Mortar has somewhat a similar Effect on them, as it in some Measure condenses the circumambient Air, so far as the Sound extends: but the Fugitives then having no Place of Retreat, being driven from their Hive by the old Swarms, are obliged to seek Security on whatever they find any Way convenient for them.

3. *Quere*, answered by Mr. Geo. Langley, of Wrangle, Lincolnshire.

The first Discovery of the hot Wells appears to be of a very ancient Date. In the King's Bath at BATH, is a Statue of King *Bladud* (whom Mr. Camden calls the Soothsayer) with an Inscription under it, importing that He discovered the Use of these Baths 300 Years before CHRIST. See *Beauties of England*, published by Mess. Davis and Reymers.

New *ÆNIGMAS* to be answered in the next Year's *DIARY*.

I. *Ænigma 230*, by Mr. Joseph Roulbée, of Thringston.

When *Sol* in southern Seas his Glory hides,
And dark'ning Fogs surround the Mountain's Sides:
When cold bleak Winds sweep thro' the low'ring Skies,
And dead the vegetable Kingdom lies,
Out of my Cell I creep, and with my Train
In hostile Form assert my wide Domain;
But think not (tho' the naked Truth I tell)
Six Summer Months confine me to my Cell:
Am I an *Hermit*? If such charge you bring,
I soon shall make you know that I'm a KING!
In splendid Robes of Majesty I shine:
The Crown, the Scepter, and the Globe are mine.
Yet chiefly amongst *Fools* my Empire lies,
I am not much regarded by the *Wise*.
The Foes are many that dispute my Reign,
With mighty Wars we shake th' embattled Plain:
Greatly I conquer; tho' sometimes I yield,
And Crimson Dyes bespread the well-fought Field.
My Followers (obedient at Command)
Are fifty sev'n, and arm'd with Clubs they stand;
Tho' (Truth I tell) there's one among my Train
Who dares oppose me; surly, proud and vain
And turbulent; regardless of my Frown
He lifts his Club, and often knocks me down!
But (when Time serves) I vindicate my Throne,
And the black *Varlet* hath my Fury known:
For soon I rise, in Majesty array'd,
Again grow terrible—and am again obey'd.

II. *Ænigma 231*, by Mr. Mathew Flinders, of Donnington.

A queer Kind of a Thing you'll think that I am
When you have heard my Tale; tho' as meek as a Lamb:
I am odd, yet of a very great Use I declare
Humble Servant to you Gents, as well as the Fair:
Several Eyes I possess, and they're all in a Row,
And into one of them my Nose often does go;

Such

32 New Ænigmas, to be answered next Year.

Such an odd Prank as this you'll think on with Surprise,
That one's Nose should be thrust into one of his Eyes!
Some wide gaping Mouths too to me do belong
Tho' for numerous Mouths I've got never a Tongue:
Yet they certainly *filling* require (that agreed on)
I am fed with such odd Food as *Men* never feed on;
From Places far off, also those that are near
From this Place and that Place, from here and from there,
My Food is collected.—Sometimes I am lean,
And quite thin and meagre—Anon I am seen
Fed with choicest of Food; but as frequent am fat
With *bad* stuffing as good, what think you of *that*?
I'm most commonly *Beauish*, and wear a lac'd Coat
But sometimes quite *Shabby*, and scarce worth a Groat:
Much belov'd by my Master and Mistress am I,
For by Chance if I'm lost—they're ready to cry!
Nay, so much I am priz'd by the bustling Throng
That I've often been stolen, as passing along:
So Adieu, my dear *Gents*—for I don't ith' least fear
But my Name will be shewn in this *Di'ry* next Year.

III. Ænigma 232. by Thomas Vaughan, M. A.

I am at a Loss the Reason to explain,
Why I'm left out by all the *Riddling* Train:
I'm Captain of some hundreds, you must know,
My Brethren all; they follow in a Row:
Yet ne'er o'ertake me: Is it not a Wonder
None of us meet, tho' never far asunder?
I do precede them all; yet can't deny
Many of them are longer far than I.
Me sev'ral of my Brethren often do
Outshine in Beauty, and in Sweetness too;
When *Sol* does shew himself to mortal Sight
And gilds the Heav'ns with his resplendent Light,
One of my Brethren always does appear
Yet I, their Chief, but once or twice a Year:
Take this one Hint the Myst'ry to unfold,
I'd but one Name, but now I've two, you're told:
If yet I'm not found out—*Gents*, don't despair,
Look in your *Di'ry*, and you'll find me there.

IV. Ænigma 233. by Mr. W. Wyd, Author of an Essay on the Character of *Manilius* in an Epistle to *Juvenis*, in which is attempted a Description of the *Distressed*, the *Miser*, and the *Liberal*; with other Epistles on several Subjects in blank Verse, lately published—Printed for the Author; Sold by Mess. *Richardson* and *Urqubart* under the Royal Exchange, Mr. *Nicoll* in St. Paul's Church-Yard; and Mr. *Bladen* in Pater Noster Row. Price 1s. 6d.

To trace my Lineage and describe my Birth,
Relate my Rise, or boast inherent Worth,

I choose

The GENT. Diary; or Math. Repository. 33

I choofe to wave—Ye Wits, let this fuffice,
I ne'er was yet deteſted of a Vice :
Tho' grave Divines to me ſometimes compare
Earth's gay Enjoyments, and their pompous Glare :
'Tis true, like *it*, I'm of a globous Form
But uſe no Guile my Lovers Eyes to charm :
I much depend on human Pow'r and Skill,
The Slave of Shew, obedient to your Will :
Whiſt I exiſt, I need no borrow'd Grace,
Since native Beauties beam around my Face ;
There, ſweetly blended, various Colours glow,
Tho' far exceeded by the Heav'nly Bow ;
But ſoon, ah ſoon, my ſhining Glories fade
And in a loathſome wat'ry Tomb are laid.

V. *Ænigma 234*, by Miſs *Polly Stow*, of *Stow*.

Leaſt of all Numbers, yet do get (Believe me, Sirs, you may)
Vict'ry o'er Kings, and them defeat : So tell my Name, I pray.

VI. *Ænigma 235*, by Mr. *William Swiſt*, of *Stow*.

All Ladies court my Beauty bright,
And like my Face to ſee :
Tho' I am blind and have no Sight,
Moſt pleaſing yet I be.
I'm ſerviceable to the Queen
(In *Silver* I appear),
And in her Chamber may be ſeen
All Months throughout the Year :
So, what I am, kind Sirs, pray ſay,
And clear up ev'ry Doubt :
I'm Flattery's Friend--by this you may
Soon find th' *Ænigma* out.

VII. *Ænigma 236*, by Mr. *John Pote*, of *Harwick*, Roxburgh-Shire,
Scotland.

I can neither eat nor drink ; I often ſpeak, but never think :
I ſcarcely ever tell a Lie ; yet teach you how to live and die.

VIII. *Ænigma 237*, by *Thomas Vaughan*, M. A.

At firſt I from my Mother's Womb with Violence was torn ;
Then ſentenc'd to ſo hard a Doom I'd rather ne'er been born :
I'm beat, and bruis'd, and knock'd about, with Inſtruments of Steel,
And into Pieces often broke, ſo hard with me Men deal :
Then, after they have us'd me ſo, I ſtill have more to bear !
I Martyrdom muſt undergo (they burn me I declare !)
Not wearied with tormenting me, they ſtill purſue their Game ;
I after this muſt drowned be, then I loſe half my Name.
But, for this deſp'rae Uſage then, I oſt with them quit Score,
And ſometimes burn thoſe very Men, that martyr'd me before.
Would you believe it, many Ways, I Frendſhip ſhew again,
And Monuments oſt help to raiſe to celebrate great Men.

34 New Ænigmas to be answered next Year.

I can dispel Sterility, by my prolific Art;
And cause a vast Fertility almost in ev'ry Part.
What I've endeavour'd to conceal; now, *Gents*, with all my Pow'r;
I do not doubt but you'll reveal, in less than half an Hour.

IX. Ænigma 238, by *Ignotus of Hull*.

When I to you (ye Bards) my Tale relate,
You'll find I'm old, and of an ancient Date;
Before the glitt'ring Stars their Light display'd
Or *Earth* from *Chaos* into Form was made;
Ere *Sol* had ting'd the Clouds with burnish'd Gold
Or murmur'ng Streams in sweet Meandres roll'd;
I had a Being—Angels by me fell,
Eternal Vengeance sunk them down to Hell.
Stirr'd up by me, rebellious Powers arose
In haughty Pride the KING of Kings t' oppose:
On Heav'n's wide Champaign the *Battalia* lay
Angelic Legions rank'd in dread Array:
Thus, first to Sin I drew the Sons of Light,
But soon defeated took myself to Flight;
And while I fled, with all the Host subdu'd;
Victorious Angels triumphant pursu'd:
No Place was found to harbor my Retreat,
Their mighty Arms destroy'd my lofty Seat;
Drove to the Verge:—with hideous Shrieks of Woe
Hurl'd headlong, flaming, to the Realms below.

When conquer'ng *Rome* made mighty Nations yield,
And Kings in Vassalage their Scepters held;
Fir'd with heroic Deeds, two Rivals burn
To grasp the Globe, and call it all their own;
The Warriors frown'd, and each exalted stood,
By *Me*, each waded e'en thro' Seas of Blood!
I charm'd their Eyes, and their whole Souls inspir'd,
While Thousands fell, and slaughter'd Heaps expir'd:
Stirr'd up by me, they wag'd decisive War,
To ride triumphant in my gilded Car.
But *Pompey* fell—! prov'd his Overthrow,
And made the *Romans* to great *Julius* bow;
Then rais'd the Hero to immortal Fame,
And made the Globe resound with *Cæsar's* Name.
But, when I led him to th' imperial Crown
He from meridian Glory tumbled down:
Then, Man, beware! my Pageantry deride;
For all my Show is empty Pomp and Pride.

X. Ænigma 239, by Mr. *John Colledge*, of *West Haddon*, near Northampton, being the PRIZE ÆNIGMA for this Year 1769 (to be answered before 2d February.)

Ye *British* Bards! I as a *Stranger* come,
Whose chief Concern in Business—is at Home;

Tho' many Times compell'd abroad to stroll
 O'er sundry beaten Tracks—exempt from Toll :
 The verdant Mead and flow'r-bespangled Plain
 Render my Efforts frivolous and vain :
 For, when I travel (let it not surprise)
 Thick Clouds of Dust and noxious Vapors rise.
 I visit oft where wealthy Crouds resort,
 And am (in Fact) a fav'rite Friend at Court !
Where I, by strictest Rules of decent Pride,
 Have gain'd Admittance at the QUEEN'S Bed-side.
 In *Oxford* too (believe me) I am known
 At *all* the public Offices in Town ;
 The *College* and the *Study* I attend,
 And to the Church of *England* am a Friend.
 But, how precarious is the Will of Fate ?
 Relating to th' Affairs of *Church* and State !
 Decay'd by Labor—and decrepid Age,
 From *all* these Honors I must disengage :
 And then, some *Youngster* of my kindreds Race
 Will (*Phoenix* like) start up, and take my Place.
 That graceful *Beard* which once adorn'd my *Chin*,
 By slow Decline, looks ghastly, weak, and thin.
 My waving Locks, by Length of Time decay'd
 (Which my stern Agent fails not to upbraid).
 When thus 'tis with me (Gents) you need not wonder
 To see my Head and Body struck asunder !
 Now, if you hope to merit true Renown,
 " Declare my Name"—and wear *Apollo's* Crown.

NEW REBUSES, PARADOXES, QUERIES, FLOWERS, &c.
 to be answered in the next Year's DIARY.

I. *Rebus*, by Mr. J. Gled, of Donington, Lincolnshire.

The Man for *Arithmetick* formerly fam'd ;
 A *Sorcerer* blind, who in Scripture is nam'd ;
 The Fish that in fresh and salt Water resides ;
 A Part of a Nut you must then add besides :
 To th' above please to join what always is seen
 In the Heavens above when the Day is serene :
 Th' Initials of these when you rightly have join'd
 Will name a sweet Fair one, endu'd you will find
 With many Perfections of Body and Mind.

II. *Rebus*, by Mr. John Bayley, of Middleton, Yorkshire.

What rapidly runs round each Day,
 What (tho' desir'd) for none will stay ;
 A Fowl, which larger few there be,
 A Fish the greatest in the Sea :
 Th' Initials join, and you'll soon tell
 A DIARIAN's Name, who few excel.

III. *Rebus*, by Miss *Polly Ashton*.

A brutal Race, which Sacred Writ record;
 An Idol by the Saxons much ador'd:
 To these, two thirds of a known Pulse unite,
 And you'll the Place find where I breathe and write.

I. Paradox, by Mr. *A. D. Witbam*.

As thro' the Neighb'ring Woods I musing rove,
 I oft retire unto a Shady Grove;
 Where only thirteen lofty Trees are seen,
 Which form, in Order plac'd, just Rows nineteen:
 Three Trees (I think) in every Row appear;
 Artists, explain this Problem the next Year.

II. Paradox, by Mr. *William Swift of Stow*.

A Man that was young at threecore and ten,
 He gave it me in and wrote it down then,
 His Friend was more old at twenty and two
 (You may think it false; but 'tis certainly true);
 Ye DIARIAN Wits, this Secret unfold:
 For old died young, and young he died old.

I. Query by Miss *Polly Stow* of *Stow*.

What *Passion* is the most that can
 Prevailing be o'er mortal Man?

II. Query by Mr. *Tho. Walker*, a Writing Master &c. at *Knarethorpe*.

If a Man should throw himself from the Top of a high Tower; doth
 he fall to the Ground by Attraction, Compression, or Gravitation?

III. Query, by Mr. *James Mills*, of *Brixworth*, near Northampton.

Were there any Heathen Temples before the Tabernacle? And whe-
 ther the Tabernacle was built in Imitation of them, or they of that?

A *Nosegay* of Flowers, presented by CORINNA, to Miss *Polly Stow*.

To lull Master asleep what the Nurse often does
 Add Latin for *and*, it's as sweet as a Rose.
 Place next your Man's Name with one Letter left out
 And a Feather that's oft us'd by Lovers no doubt,
 What now-a-days some call a good Country Dame,
 What Gents wear in the Morning and Clowns when they're lame;
 Two fifths of what Students are left to the Care of;
 And a Feature I now rob the Face of the Fair of;
 What Courtiers are always well known to profess
 But seldom, if ever are found to possess;
 Pick next (dear Miss *Stow*) what some wish to recall
 And with these dress the Flow'r Pots that stand in your Hall.

CORINNA.

ANSWERS

ANSWERS to the QUESTIONS in last Year's
DIARY.

(1.) Quest. 305, answered by Mr. William Forrester, 2
Serjeant in the first Regiment of Dragoon Guards.

From first Equation $z=37-x-y$; put $v=37-x$, then
 $z=v-y$, $z^2=v^2-2vy+y^2$, and $z^3=v^3-3v^2y+3vy^2-y^3$:
 $x=37-v$, $x^2=1369-74v+v^2$, and $x^3=50653-4107v$
 $+111v^2-v^3$; substitute the Value of z found above in the
2d and 3d Equations, and we shall have $2y^2-2vy+v^2+x^2$
 $-509=0$; and $3vy^2-3v^2y+v^3+x^3-7675=0$; and by
the Method of Extermination (see p. 120. Emerson's
Algebra) from last two Equations $a=2$, $b=-2v$, $c=v^2+$
 x^2-509 , $f=3v$, $g=-3v^2$, $h=v^3+x^3-7675$, therefore
 $bf-ag=0$, consequently $bb-cg=0$; $cf=3v^2+3vx^2-$
 $1527v$, $ab=2v^3+2x^3-15350$: $cf-ab=v^3+3vx^2-2x^3$
 $-1527v+15350=0$. An Equation clear of y ; and by
substituting the Values of x before found into this last
Equation, and proper Reduction, we shall have v^3-74v^2+
 $1799v=14326$; whence $v=19$, and $x=18$, $y=11$,
 $z=8$; and the Age required is found to be 18 Years,
11 Months, and 8 Days.

The same answered by Mr. William Stephens, of Redruth.

Let $s=37$, $m=509$, and $n=7675$.

per Transp. $\left\{ \begin{array}{l} 1 \quad x+z=s-y \\ 2 \quad x^2+z^2=m-y^2 \\ 3 \quad x^3+z^3=n-y^3 \end{array} \right.$

1	4	$x^3+3x^2z+3xz^2+z^3=s^3+3s^2y+3sy^2$ $-y^3$
4 - 3	5	$3x^2z+3xz^2=i^3-3s^2y+3sy^2-n$
1 x 2	6	$x^3+xz^2+zx^2+z^3=ms-my-sy^2+y^3$
6 - 3	7	$xz^2+zx^2=ms-my-sy^2+2y^3-n$
7 x 3	8	$3xz^2+3zx^2=3ms-3my-3sy^2+6y^3$ $-3n$
8 - 5	9	$6y^3-3sy^2-3my+3ms-3n=s^3+3sy^2$ $-3s^2y-n$
9 ÷ 6	10	$y^3-37y^2+430y=-1584$. Solved $y=11$.

Whence the Age=18 Years, 11 Months, and 8 Days.

(2.) Quest. 306, answered by Mr. *Gerwase Cliff* of *Rudington*; addressed to Mr. *Atkinson* of *Ingham*, in *Lincolnshire*.

Your Charmer's Fortune (by *Algebra*) is found
To be just five and twenty Hundred Pound;
Her Age likewise it maketh to appear
To me to be, exactly eighteen Year:
Her Height in Inches (if my Answer's right)
Wants only *one* to make it Fifty-eight:
Therefore, kind Sir, if you intend to wed,
I'd have you take that Lady to your Bed.

The same answered by Mr. *Henry Flock*, of *Bladon*, near *Newcastle*.

$$\left\{ \begin{array}{l} 1 \quad x^2 + x^2 y^2 z^2 = 6579225000324 = a \\ 2 \quad x^2 y^2 + y^2 z^2 = b = 20307302676 \text{ (and not, as printed in } Diary) \text{ per Quest.} \\ 3 \quad x^2 y^2 z^2 + z^2 = c = 6579231250000. \end{array} \right.$$

$$\begin{array}{l|l|l} 2 \div y^2 & 4 & x^2 + z^2 = \frac{b}{y^2} \\ 3 - 1 & 5 & z^2 - x^2 = c - a \\ 4 + 5 & 6 & 2z^2 = \frac{b}{y^2} + c - a; \text{ and } z^2 = \frac{b + cy^2 - ay^2}{2y^2} \\ 4 - 5 & 7 & 2x^2 = \frac{b}{y^2} + a - c; \text{ and } x^2 = \frac{b + ay^2 - cy^2}{2y^2}, \text{ by substituting these Values of } x^2, \text{ and } z^2, \text{ in the first Step, and reducing, we have } \frac{y^4 + 2a - 2cy^2}{c - a} = \frac{b^2 + 2b}{c - a}, \text{ and solved by} \end{array}$$

the Method for Quadratics, $y = 57$; and from thence x , and z , are readily found $= 18$, and 2500 respectively: consequently the Lady's Age is 18 Years, her Height 57 Inches; and her Fortune 2500 Pounds.

(3.) Quest. 307, answered by Mr. *George Lodge*, at *New-Market School*.

As z , by Inspection, appears larger than v , and y larger than x ; put $m + n = z$, $m - n = v$; also $s + r = y$; $s - r = x$, and the given Equations will stand as follows:

Viz.

Viz.
$$\begin{cases} 1 \sqrt{m-n+2s+m+n}=36,732 \\ 2 \sqrt{-r+s+2m+r+s}=27,7416 \\ 3 \sqrt{r+s+2m-r+s}=25,1231 \\ 4 \sqrt{m+n+2s+m-n}=36. \\ 1-4 \quad 5 \sqrt{m-n}-\sqrt{m+n}+2n=0,732 \\ 2-3 \quad 6 \sqrt{-r+s}-\sqrt{r+s}+2r=2,6185 \\ \text{Whence} \quad 7 \quad m=3,5; n=,5; s=15,5, r=1,5 \\ \text{And} \quad 8 \quad v=3; x=14; y=17; z=4. \\ \therefore \quad 9 \quad \text{A CORD is the fatal Remedy.} \end{cases}$$

Mr. William Reynolds sent the following Answer to the same.

It appears from *Algebra*, that $v=3$; $x=14$; $y=17$, and $z=4$: Whence I find CORD.

It seems poor *Sudlow* has a Cord in View,
To cure his Grief—He'll bid the World adieu:
Oh foolish Man!—Pray be advis'd by me,
Rather than hang *thyself*; go—hang up *She*.

(4.) Quest. 308, answered by Mr. Robert Langley, of *Hitchin*.

Let p =the given Periphery, x =the transverse, and y =conjugate Diameter. Then (per *Conics*) $x:y::y:$

$\frac{y^2}{x}$ =Latus Rectum; and $\sqrt{\frac{x^2-y^2}{4}}$ =Distance of the Focus

from the Center of the Ellipsis. $\therefore \frac{y^2}{x} \times \sqrt{\frac{x^2-y^2}{4}} =$

$\sqrt{\frac{x^2 y^4 - y^6}{4x^2}}$ is a Minimum (per Quest.) But $2\sqrt{x^2+y^2}$

$+ \frac{y}{3} = p$; whence $x^2 = \frac{9p^2 - 6py - 3y^2}{36}$; writing this in the

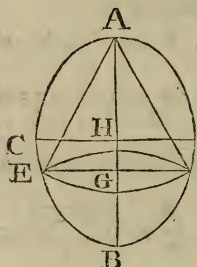
Minimum above, gives $y^4 - \frac{36y^6}{9p^2 - 6py - 3y^2}$ a Minimum
which fluxed and reduced, gives $81p^2 - 108p^3y - 1080p^2y^2$
 $+ 690py^3 + 3485y^4 = 0$. Whence y may be determined.

(5.) Quest. 302, answered by Mr. Ed. Smith, of *Baldock*.

By the Quest. the arising Points of the Ecliptic were the
 $26^\circ 4'$ of *Cancer*, and $17^\circ 23'$ of *Leo*; whence the Declina-
tions

tions are $20^{\circ} 59'$; and $15^{\circ} 40'$, whose Tangents let be a , and b ; and n the Sine of 30° , the Ascensional Differences; and x the Cotangent of the Complement of the Latitude; then, as Radius $1 : x :: a : ax$, the Sine of the Ascensional Difference of the $26^{\circ} 4'$ of *Cancer*; again $1 : x :: b : bx$ the Sine of the Ascensional Difference of the $17^{\circ} 23'$ of *Leo*. Then by *Emerson's* Trigon. Prop. 6. $ax \times \sqrt{1-b^2x^2} - bx \times \sqrt{1-a^2x^2} = 1 \times n$; reduced, &c. we have $a^4 - 2a^2b^2 + b^4 + 4n^2a^2b^2 \times x^4 - 2n^2a^2 - 2n^2b^2 \times x^2 = -n^4$; in Numbers completing the Square, &c. $x = .77915$ true to the last Figure, the Cotangent of $37^{\circ} 55'$. Whence the Latitude of the Place is $52^{\circ} 5'$; and the arising Point of the $26^{\circ} 4'$ of *Cancer* in the Ecliptic, is 50 minutes and 28 seconds past 4 o'Clock in the Evening.

(6.) Quest. 310, answered by Mr. *James Young*, of *Newton*, *Northumberland*.



Let $2a$, and $2b$ = the transverse and conjugate Axes of the Spheroid; also let $x = AG$, and $y = FG$; then will $2a - x = GB$; furthermore, let $p = .7854$. Then $4py = \frac{1}{2}$ the Circumference at the Base; and $\sqrt{a^2 + y^2} = AF$; then $4py\sqrt{x^2 + y^2} =$ the curve Surface, and $4py^2 =$ the Area of the Circle EF ; then (per Data) $4pv\sqrt{x^2 + y^2} + 4py^2 =$ a Max.

or (because $4p$ is constant) $y\sqrt{x^2 + y^2} + y^2 =$ a Max. but, by the Nature of the Spheroid, it will be as $a^2 : b^2 :: 2ax - x^2 : y^2 \therefore a^2y^2 = 2ab^2x - b^2x^2$; and by Division $y^2 = \frac{2ab^2x - b^2x^2}{a^2} = 13\frac{1}{3}x - \frac{4}{9}x^2$; and $y = \sqrt{13\frac{1}{3}x - \frac{4}{9}x^2}$; these

two Values of y^2 and y taken in the Maximum will be $\sqrt{177\frac{7}{9}x^2 + 1\frac{1}{2}\frac{3}{7}x^3 - \frac{20}{81}x^4} + 13\frac{1}{3}x - \frac{4}{9}x^2 =$ a Maximum.

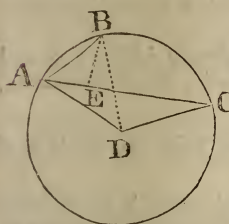
In Fluxions $\frac{355\frac{5}{9}x\dot{x} + 4\frac{4}{9}x^2\dot{x} - \frac{80}{81}x^3\dot{x}}{2\sqrt{177\frac{7}{9}x^2 + 1\frac{1}{2}\frac{3}{7}x^3 - \frac{80}{81}x^4}} + 13\frac{1}{3}\dot{x} - \frac{8}{9}x\dot{x} = 0$.

Out of Fluxions, &c. and rightly ordered, will at last become $180x^3 - 3780x^2 - 95175x + 1944000 = 0$. Solved $x = 19$,

132875

132375=AG=the Cone's Height, and consequently all that is required may be easily found.

(7.) Quest. 311, answered by Mr. Alex. Rowe, near Penzance.



In the spherical Triangle ABC, are given $AB=10^\circ$, $BC=20^\circ$ and $AC=26^\circ$. To find (by Spherics) the $\angle ACB=20^\circ 44' 17''$. Then (after the perpendicular BE is let fall on AC) in the right angled spherical $\triangle BCE$ are given $\angle E=90^\circ$, $\angle BCE=20^\circ 44' 17''$ and $BC=20^\circ$, to find $BE=6^\circ 57' 22''$.

Then (by *Simpson's Geom.*) $DA=DB=DC$ (the Radii of the Circle ABC, being taken as Chords of their respective Arcs, because these are but small) $= \frac{AB \times BC}{2BE} = 14^\circ 22' 23''$ the Distance required.

The same, answered by Mr. Edward Parnell, of Nuneaton.

In this Problem, there is no more required, if we take the plane Triangle formed by the Chords of the given Distances of the three Stars A, B, and C, than to find the Radius of its circumscribing Circle; which is the right Sine of their required Distance from the fourth Star D (for it is evident, by the nature of the Question, the Places of the three Stars A, B, and C, must be on a parallel Circle of the Sphere, whose Pole is in the Place of the fourth Star D; and it is well known, the Radius of that Circle is the right Sine of its Distance from the Pole) which, by plane Trigonometry, will be found = the Sine of $14^\circ 23'$ the Distance required.

(8.) Quest. 312, answered by Mr. Robert Snowball, near Hedley, Northumberland.

Put x = the Perpendicular BD; and $a=AD=20$ (see Fig. in last Year's DIARY); then $\sqrt{a^2-x^2}=AB$; and $5:3::\sqrt{a^2-x^2}:3\sqrt{a^2-x^2}$; $\frac{3\sqrt{a^2-x^2}}{5}=BC$; also $\frac{3\sqrt{a^2-x^2}}{5} \times \frac{x}{2}$ = the Area of the $\triangle BDC$; and $\frac{x\sqrt{a^2-x^2}}{2}$ = Area of

$\triangle ABD$;

$\triangle ABD$; but $\frac{3x\sqrt{a^2-x^2}}{10} \times \frac{x\sqrt{a^2-x^2}}{2} = \text{a Maximum. In}$

Fluxions $6a^2x\dot{x} - 12x^3\dot{x} = 0$. Reduced, $a^2 = 2x^2$, and $x = \frac{a}{\sqrt{2}} = \text{Ch. 14, 14213}$; whence it is evident $AB = BD$,

and from thence the Area of the Triangle $ABD = 100$, and the Triangle $BDC = 60$ Square Chains, respectively $= 10$, and 6 Acres.

(9.) Quest. 313, answered by Mr. John Garton, Jun. of *Chilwell*.

The Diameter of the Earth (allowing it to be 7970 Miles) I find (by 47. Eu. 1.) the Height of the Mount to be 1,104,539 Miles; the double of which added to the Diameter of the Earth gives 7972,209,078 Miles, the Diameter of the Earth and Water; which cubed and the Product $\times 5,236$, it will give 265,299,039,498,616,692 = solid Miles in the Earth and Water; from which subtract the solid Miles contained in the Earth, and the Remainder will be 220,479,875 = the solid Miles of Water, which multiply by the Tuns in one Mile gives 788,041,752,582,333,74,3946 = the Tuns of Water then brought upon the Earth.

(10.) Quest. 314, answered by Mr. G. Glossop, at *Pool-green School*.

Let $a = OD = 30$, $b = AO = 20$; $a = 7854$, $x = OE$; and $y = OH$ (see last Year's Fig.) then, by the Property of the Ellipsis, as $a^2 : b^2 :: a^2 - x^2 : b^2 - \frac{b^2 x^2}{a^2} = \overline{GE}^2$; whence

$2\sqrt{b^2 - \frac{b^2 x^2}{a^2}} = GF$, this squared, and \times by a , we have

$4a \times \frac{b^2 - \frac{b^2 x^2}{a^2}}{a^2} = \text{the Area of the Circle GF; which } \times$

by \dot{x} makes $4a\dot{x} \times \frac{b^2 - \frac{b^2 x^2}{a^2}}{a^2}$; the Fluent $4ab^2x - \frac{4ab^2x^3}{3a^2} = \text{the solid Part ABGF. Again, by the Property of the Ellipsis,}$

Ellipsis, as $b^2 : a^2 :: b^2 - y^2 : \frac{a^2 b^2 - a^2 y^2}{b^2} = \overline{HF}^2$; whence

$2\sqrt{\frac{a^2 b^2 - a^2 y^2}{b^2}} = FL$. And by the Property of the Circle

$\overline{b+y} \times \overline{b-y} = b^2 - y^2 = \overline{HI}^2$; whence $2\sqrt{b^2 - y^2} = KI$

now $2\sqrt{b^2 - y^2} \times 2\sqrt{\frac{a^2 b^2 - a^2 y^2}{b^2}} \times a = 4a \times \frac{ab^2 - ay^2}{b} =$

the Area of the Ellipsis whose Diameters are FL, and IK;

which \times by y we have $\frac{4aab^2y - 4aay^3}{b}$; the Fluent is

$\frac{4aab^2y - 4aay^3}{b^3} =$ the solid Part LFCD. And (per Quest.)

$\frac{4aab^2y - 4aay^3}{b} = 4ab^2x - \frac{4ab^2x^3}{3a^2}$; this divided by $4a$,

we have $\frac{ab^2y - \frac{1}{3}ay^3}{b} = b^2x - \frac{b^2x^3}{3a^2}$; now substituting

$\sqrt{\frac{b^2a^2 - b^2x^2}{a^2}}$ for y its equal, and clearing the Fraction,

we have $3a^2b\sqrt{b^2a^2 - b^2x^2} - \sqrt{b^2a^2 - b^2x^2} \times \overline{ba^2 - bx^2}$

$= 3a^2b^2x - b^2x^3$. And by Reduction we have $x^6 -$

$\frac{3a^2x^4}{2} + \frac{9a^4x^2}{2} = 2a^6$. In Numbers $x^6 = -1350x^4 +$

$3645000x^2 = 145800000$; whence is found $x = 21$, 21

nearly, and $y = \sqrt{\frac{b^2 - b^2x^2}{a^2}} = 14, 14$.

(11.) Quest. 315, answered by Mr. William Kingston,
of Bath.

Let $a = PG$; $b = PF$ (see Fig. in last Year's DIARY)
 s , and $c =$ Sine and Cofine of $60^\circ = \angle ABC$; x and y .
 $=$ Sine and Cofine PBG, $sy - cx$ and $cy + xs =$ Sine and

Cofine of $\angle PBF$; then $x : a :: 1 : \frac{a}{x} = BP$; and $sy - cx : b$

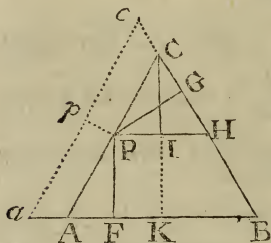
$:: 1 : \frac{b}{sy - cx} = BP = \frac{a}{x}$ as above $\therefore bx = asy - acx \therefore acx$

$+ bx$

$$+lx = asy \therefore \frac{x}{y} = \frac{as}{b+ac} = \text{the Tangent of the Angle}$$

PBG, from whence BP, PG, and PF are known. But how *this* can admit of a *Minimum* I cannot comprehend, as the nearer AC approaches P, the lesser will the Triangle ABC be; and the *least* when AC coincides with P; but then P cannot be said to be *within* the Triangle, as it will be then in *one* of its Sides.

The same, answered by Mr. Henry Taylor, of *Bishop-Wilton*.



It is plain by Inspection, that the least Triangle will be formed, when the Side AC passes through the given Point P; for all Lines parallel thereto, as *ac*, will it is plain increase the Area more and more, as *Pp* perpendicular to *ac*, increases (per Quest.) the Area *PGBF* is always constant.

Therefore through P, draw PH parallel to AB, and bisect PH in I, and let IC be perpendicular to PH, and take IC = PG; through P draw CPA, and the Triangle ABC will be the least possible.

DEMONSTRATION. It is a known Property of the equilateral Triangle, that the Sum of the two Perpendiculars PF and PG is always = CK the Perpendicular of the whole Triangle; PF = IK, and PG = IC; therefore CK = PF + PG; and consequently the Triangle ABC is the least possible, by what is proved above.

CALCULATION. Since $PF + PG = CK$, and (per Eu. 47. 1.) $CK^2 = CA^2 - \frac{CA^2}{4}$; $\therefore \frac{3}{4} \times AC^2$, $CK = \frac{1}{2}$

$AC \times \sqrt{3}$, therefore $AC = \frac{2}{\sqrt{3}} \times PF + PG$. Q. E. D.

(12.) Quest. 316, answered by Mr. *Alexander Rowe*, the Proposer.

Taking the square Root of the first given Equation, we have $2a^3\dot{x} - 3y^3\dot{x} = 5m^2\ddot{x} \therefore 2a^3 - 3y^3 = 5m^2\dot{x} \therefore \dot{x} = \frac{2a^3 - 3y^3}{5m^2}$. Now take the Fluent of the second Equation,

and we get $\dot{x} = \frac{x^4}{4} \therefore \frac{x^4}{4} = \frac{2a^3 - 3y^3}{5mm} \therefore x^2 = \frac{8a^3 - 12y^3}{5m^2}$

$$\therefore x = \sqrt{\frac{8a^3 - 12y^3}{5m^2}}.$$

(13.) Quest. 317, answered by Mr. *Thomas Walker*.

Put $u = 150$, $R = 1.04$, and $P =$ the present Worth of 150 l. per *Annum*. Then by the Nature of Annuities

$$\frac{u}{R-4} = 37501.$$

Then put $A = 3750$; $P = 100$, $R = 1.04$; and $t =$ the Time in which 100l. put out at Compound Interest, will

amount to 3750. Then will $\frac{A}{P} = Rt$; whence $\text{Log. } A$

$$- \text{Log. } P = \text{Log. } R + \text{Log. } t; \text{ Ergo } \frac{\text{Log. } P}{\text{Log. } R} = t = 92.409$$

Years required.

* * At *Knarefboro*, in *Yorkshire*, Youth are boarded, and carefully and expeditiously taught Writing, Arithmetic, Merchants Accompts, and all the Branches of the Mathematics, by *Thomas Walker*.

N. B. *Knarefboro'* is situate in the most pleasant and healthful Part of the County of *York*.

✍ Particular Regard to Morals and Behaviour.

* * The worthy and ingenious Contributors to this *Diary* are again desired to accept of the *Author's* sincerest Thanks for their kind Assistance and Encouragement; and is in great Hopes that he may (as it gives him no small Concern) be generously excused the not publishing any *Solution* to the *Prize Question*, not one coming to Hand worthy Publication: However, the next Year (God willing) purposes to oblige the Gentlemen CONTRIBUTORS with a proper Answer to the same; but, in the mean Time, is in Expectation that some of them

them will be carefully considering the Nature of the Curve, together with its Equation, &c.

He further most earnestly desires, that the CONTRIBUTORS hereto will be pleased, at all Times hereafter, to send such Things as shall either be entirely *New*, or (if otherwise) *much* improved, so as to be useful and more entertaining; and also that the *Schemes* or *Figures*, may be drawn as perfect as possible, and of a proper Size for the DIARY; likewise, that all Equations may be brought out in Numbers, &c.

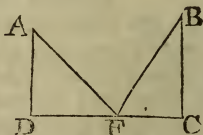
And whereas a great many Letters often come too late to Hand to be taken Notice of (as the ingenious Mr. *Metcalf's*, with his Calculations of the *Eclipses*, and many others did this Year), the Dates whereof prove it to be no Fault in the *Postage*; the *Editor* therefore desires that for the Future the Letters may all come to Hand within the Time limited for that Purpose, in Order to their having a due Perusal, and being carefully compared one with another, &c. The Author using his best Endeavour, and being determined (so far as possible) that nothing shall be wanting in him (so far as in his Power) to promote useful Knowledge, and give due Encouragement to whoever shall appear deserving of it, &c.

N. B. No QUESTIONS, or other Things, shall ever for the future be published in this DIARY, except their Solutions at large be sent along with them.

New MATHEMATICAL QUESTIONS to be answered in the next Year's DIARY.

(1.) Quest. 319, by Master *Hutton Wood*.

Let there be two Perpendiculars AD, BC; AD=18, BC=24 Feet; and the Base DC=36: The Hypotenuse AF=FB, is to be placed in the Base (suppose at F), so as to reach the Top of both Perpendiculars; Quere the Point F in the Base; and the Length of the Hypotenuse?



(2.) Quest. 320, by Mr. *Thomas Walker* of *Knarebro'*.

Given $y^4 - z^4 = y + z$; require y and z ?

(3.) Quest.

(3.) Quest. 321, by Mr. *T. Atkinson*, of *Ingham, Lincolnshire*.

Once formerly I did with Freedom flow,
But now, alas! I bid that time adieu;
Fast bound with Chains, I now confin'd must lie,
Lamenting much in fore Captivity!

Ingenious *Algebraists*, haste to my Relief,
Shew in a Word * the Cause of all my Grief!

* Viz. $w+x+y+z=50$. $wy-xz=150$. $\frac{xy}{wx} = 5$, 2727.

$w+x=y+z$. Where w , x , y , and z , shew the Places in the Alphabet of the Letters composing the required Word.

(4.) Quest. 322, by Mr. *Robert Langly* of *Hitchin*.

A Lady's Age and Fortune are defin'd,
In the Equations † hereunto subjoin'd;
Diarian Artists, make the same appear
In your DIARY the ensuing Year.

† Viz. $\left\{ \begin{array}{l} y^2x-x^2=42345959 \\ y^2-x^2=1390100 \end{array} \right\}$ Where x represents the Lady's Age, and y her Fortune in Pounds.

(5.) Quest. 323, by Mr. *Thomas Barker*, of *Wiffett, Suffolk*.

A Gentleman has a Garden in the Form of a Quadrant, whose Radius is 40 Poles; in which he has ordered his Gardener to make a Canal at one of its Vertices, in such Sort, that the Rectangle of the Secant and Cosine shall exceed the Product of the Cotangent and Versed Sine by a *Maximum*; required the Garden's Area?

(6.) Quest. 324, by the same Gentleman.

Let $z^8+ax^4=y$, and $ax^4-z^8=y$; Quere the Value of z , in Terms of a , and y ; by the Investigation of Fluxions, &c.

(7.) Quest. 325, by Mr. *Thomas Robinson*, of *Biddick*.

In a right angled Triangle, whose Base and Perpendicular are 48 and 36; required the Dimensions of the greatest inscribed Parabola; whose Abscissa is parallel to the Perpendicular of the Triangle?

(8.) Quest. 326, by Mr. *Henry Tilney*, of *Harleston*.

To determine the Dimensions of the Greatest Parabola that can be inscribed in the Sector of a Circle whose Radius is 20; and the Angle at the Center 60 Degrees?

(9.) Quest.

48 New QUEST. to be answered next Year.

(9.) Quest. 327, by Mr. *Alexander Rowe*, of *Penzance*.

In what North Latitude is the shortest Day equal to $\frac{2}{3}$ of $\frac{4}{5}$ of the longest at *London*?

(10.) Quest. 328, by Mr. *Robert Langley* of *Hitchin*.

I have a cylindrical Cistern in my Garden, standing truly Horizontal (whose Use is to water the same). On *November* the 21st in the Morning, being in Latitude 52° North; I observed the Shadow of the Top of the Cistern, falling on its opposite Side, whose lowest Distance from the Top was 6 Inches: instantly I ordered the Cistern to be filled with Water, and then found the Shadow's lowest Distance from the Top to be 20 Inches, which is the Depth of the Cistern: Required the Diameter, and Content of the same in Ale Gallons; and also the Hour of the Day, when this curious astronomical Observation was made?

(11.) Quest. 329, by Mr. *Alexander Rowe*.

Given the Fluxionary Equation $3.375a^3 \dot{x}^3 \dot{y}^3 - 6.75a^2 \dot{y} \dot{x}^3 \dot{y}^3 + 4.5ay^2 \dot{x}^3 \dot{y}^3 - y^3 \dot{x}^3 \dot{y}^3 = 27m^6 \dot{x}^3$. Required the relation of x and y , when $x^2 \dot{x}$ is to \dot{y} as 3 to 2.

(12.) Quest. 330, PRIZE QUESTION, by Mr. *Rob. Langley*.

Whoever shall send the best Solution to it, and the best Poetical general Solution to all the *Ænigmas*, before Candlemas Day 1769, shall be entitled to the usual Yearly PRIZE of DIARIES.

Ingenious Artists, whose unbounded Skill,
The deepest Problems can resolve at Will;
In ev'ry useful Science, you may find,
Curious Theorems t'improve the Mind.
Know then, kind Artists, in a *Gauger's* Round,
A Cask upon the *Tilt* was lately found;
A Spindle * Parabolic seemed to be * *Midd. Frustum*
Whose Axis makes an Angle sixty three †,
Its Head Diameter is sixty-seven, Inches
Bung eighty-two; Length a hundred and 'lev'n:
What Liquor in the Cask does now remain,
Next Year, kind Philomaths, declare the same.

† Degrees with the Horizon; and the Beer just touches the Bulge.

F I N I S.



To be S O L D,

By JER. ROE, in *Derby*,

THE new improv'd English SLATES, now brought to great Perfection; they are light, and not liable to be broken; very proper for Schools, Bars of Taverns, &c. — The new invented MUSIC BOOKS, particularly useful for learning and composing Musick. — Also new invented MEMORANDUM BOOKS, very neat and handy. — Likewise POCKET BOOKS, greatly improv'd, more commodious and durable than any others now in Use, with SLATE PAPER MEMORANDUM-BOOKS of all Sizes. — Also Ink clarified from the Cakes, being free from Sediment, and thin as Water, in two Days after it is us'd will be the finest and deepest Black, and will continue so while the Paper or Parchment will endure.

N. B. Gentlemen and Ladies, by giving their Orders to the said JER. ROE in DERBY, or S. ROE, in ASHBURN, may be supplied with any Modern Books, Pamphlets, Magazines, or have any Books neatly bound, gilt, and letter'd, at the lowest Prices.

By J. R O E in *Derby*, and S.
R O E in *Asfburn*, are sold
the following Medicines;

THE true Original Daffy's Elixir, from the old
Warehouse in Salisbury Court, Fleet-Street,
where it was first made and sold, 1s. 3d per
Bottle.—Peter's Pills 1s. a Box, and his Cordial Tinc-
ture at 1s. 3d. per Bottle.—Dr. Lobb's Tincture for
Family Use, 2s. 6d. each Bottle.—Dr. James's Fever
Powder, 2s. 6d. each Packet.—Hoopers Female Pills
1s. per Box.—Anderson's Scotch Pills 1s. a Box.—
Hadfield's Tincture for fresh Wounds 1s. per Bottle.
—Jackson's Tincture for Burns, Scalds, &c. 1s. each
Bottle.—Greenhough's Tincture for preserving the
Teeth and curing the Tooth Ach 1s. each Bottle.—
Dr. Radcliff's Purging Elixir 1s.—The genuine British
Oil which cures all Scorbutic and Rheumatic Disorders
Price 1s.—Ditto refin'd Price 1s. 6d.—Also the Baume
de Vie, a most efficacious Medicine against many Dis-
orders, first discover'd by the Apothecary to the King
of France, Price 3s. each Bottle.—Blaggrave's golden
and plain Spirits of Scurvy Grass 1s. each.—The
Stomachic Lozenges 1s. 6d. a Box.—British Powder
for Teeth 1s.—Godfrey's general Cordial, Price 6d.—
Chymical Drops for the Cure of Coughs, Colds,
Asthmas, &c.—Stoughton's Elixir Price 1s.

LH 3579